Central Valley Flood Protection Board
March 21, 2008 Meeting

Staff Report

Evidentiary Hearing on Application for Board Permit No. 18159-3

Natomas Levee Improvement Program
Sacramento River East Levee Phase I Improvement Project, Reaches 1 - 4B
Sacramento Area Flood Control Agency, Sutter and Sacramento Counties

---

Item

Hold hearing and consider approval of Draft Permit No. 18159-3 BD (Attachment 1) to place landside fill to raise and widen approximately 22,800 feet of the existing east project levee (left bank looking downstream) of the Sacramento River, and to install seepage remediation measures including seepage berms, relief wells and surface drains.

The Board approved sending a 33 USC Section 408 request to approve these alterations to the Sacramento River Flood Control Project to the U.S. Army Corps of Engineers at the January 18, 2008 meeting. The letter was sent on February 14, 2008 along with supporting documentation submitted by SAFCA.

Applicant

Sacramento Area Flood Control Agency (SAFCA), 1007 7th Street, 7th Floor, Sacramento, California 95814.

Location

The Natomas Basin is comprised of approximately 53,000 acres in northern Sacramento and southern Sutter Counties, including a portion of the city of Sacramento. The basin is generally bounded by leveed reaches of the Natomas Cross Canal (NCC) on the north, the Sacramento River on the west, the American River on the south, and the Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal (NEMDC) / Steelhead Creek on the east.

Figures 1 and 2 provide maps of Natomas Levee Improvement Project components and Reclamation District 1000 respectively.

The project area for the proposed NLIP component described in this report begins at the NCC (River Mile 78.9) in Sutter County and continues downstream to approximately River Mile 74.6 north of Elverta Road in Sacramento County. This area has been denoted as Reaches 1 through 4B of the Sacramento River east levee by SAFCA as depicted in Figure 3. The project is within the operations and maintenance jurisdiction of Reclamation District 1000, one of SAFCA's parent agencies.

Need for Board Action

In addition to federal 33 USC Section 408 approval to alter the flood control project, the Board must conduct an evidentiary hearing on this project in order to issue a Board permit.

Existing Flood Control and Irrigation Facilities

An 18-mile-long section of the east levee of the Sacramento River protects the west side of the Natomas Basin between the NCC and the American River. For planning purposes SAFCA has divided the east levee into 20 reaches as shown in Figures 3 and 4. The Garden Highway is located on top of the levee crown. A drained, 10-foot-wide stability berm is present on the landside slope of the levee between the NCC and Powerline Road (Reaches 1 – 12). Cutoff walls were previously constructed through the levee in Reaches 12– 20.

Figures 5 – 8 provide more detailed views of features along the Sacramento River east levee.

The land uses along the levee vary from north to south. Along the land side, Reaches 1–13 are bordered mainly by private agricultural lands containing a few rural residences, Airport bufferlands, and two farmed parcels of The Natomas Basin Conservancy (TNBC). Teal Bend Golf Club is west of the Airport, adjacent to the levee along Reach 6. The parcels bordering Reaches 14–18 contain more residences, several rural estates, and three TNBC parcels. The land side of Reaches 19 and 20 is bordered by residential subdivisions, a business park, and the City of Sacramento's Natomas Oaks Park, undeveloped Costa Park site, and Shorebird Park.

Several marinas and three restaurants are located along the water side of the levee in Reaches 1–18. Sacramento County's Elkhorn Boat Access is located in Reach 9. More than 150 residences and numerous private boat docks are located between the lower part of Reach 2 and the lower part of Reach 18; as mentioned previously, many fences, gates, and other appurtenances associated with these properties are located on the levee itself. On the water side of the levee in Reaches 19 and 20 are a mix of residences, private boat docks, businesses, and Sand Cove Park. Discovery Park is just southeast of Reach 20.

Several irrigation canals, pipelines, wells, and pump stations exist along the Sacramento River east levee. The Elkhorn Main Irrigation Canal (Elkhorn Canal) and the Riverside Main Irrigation Canal (Riverside Canal) are key agricultural irrigation canals in the Natomas Central Mutual Water Company (NMWC) system. The Elkhorn Canal runs parallel to the Sacramento River east levee from the North Drainage Canal in Reach 4B through Reach 8 and into the start of Reach 9 (1,250 feet south of Elkhorn Boulevard); this canal is supplied by the Prichard and Elkhorn Pumping Plants on the Sacramento River. The Riverside Canal extends from just north of Reach 13 to the middle of Reach 19 and is supplied by the Riverside Pumping Plant, on the Sacramento River just north of Radio Road. Several lateral canals connect to the Elkhorn and Riverside Canals. The existing Elkhorn and Riverside Canals are highline canals that use gravity flow to deliver water for irrigation by maintaining water levels above the surrounding ground levels. These canals have earthen embankments with side slopes that are nearly vertical, requiring regular maintenance.

In addition to the NMWC irrigation systems, there are several landowner-operated systems along the levee. These facilities are located primarily in Reaches 1–4A and 9–12, in areas not currently served by the NMWC systems. The areas are serviced by either well pumps on the land side or river pumps, which discharge into buried pipelines, small irrigation ditches, or directly onto fields. The distribution systems run along the landside toe of the levee to supply fields that slope away from the levee. There are approximately nine small pumping plants that provide water from the river and approximately 10 groundwater well pumps.

Several drainage pumping plants are operated by RD 1000 along the Sacramento River east levee. These facilities pump drain water from the main drainage canal system into the river. They include Pumping Plant No. 2, located in Reach 4B; Pumping Plant No. 5, located in Reach 10; Pumping Plant No. 3, located in Reach 13; and Pumping Plant No. 1, located in Reach 20A. Pumping Plant No. 2 was temporarily removed as part of an emergency levee repair in 2006 and would be replaced as an element of the proposed project in 2009–2010.

Prior History

The NLIP is a comprehensive flood control improvement program designed to provide the Natomas Basin with at least a 100-year level of flood protection by the end of 2010 and a “200-year” level of protection by the end of 2012.

Attachment 2 provides a history of events, studies, authorized projects, and legislation leading up to SAFCA’s Natomas Levee Improvement Program. Prior Staff Reports prepared for the December 2007 and January 2008 Board meetings also included this history. Since the Board has already reviewed the history twice it has been moved to Attachment 2 to shorten the body of this Report.

Description of Proposed Project Improvements

The Sacramento River East Levee, Phase 1, Reaches 1 through 4B component of the NLIP includes placement of landside fill to construct a raised adjacent setback levee and seepage remediation measures including seepage berms and relief wells where required to reduce seepage potential along approximately 22,800 linear feet of the landside slope of the existing east (left bank looking downstream) project levee.

Portions of the Sacramento River east levee are not high enough to provide at least 3 feet of freeboard above the 100-year water surface elevation, and several reaches do not provide 3 feet of freeboard above the "200-year" design water surface elevation (Figure 9).

Under- and through-seepage vulnerability has also been identified in the project reaches, with areas not meeting recently adopted federal criteria for safely containing underseepage and through-seepage when the water surface in the adjacent channel reaches the 100-year elevation and higher.

Figure 10 depicts NLIP reaches requiring underseepage remediation while Figure 11 depicts typical levee seepage mechanisms.

To address both freeboard and seepage deficiencies, SAFCA is proposing to construct an "adjacent setback levee" (Figure 12) consisting of a new levee crown and embankment adjoining the land side of the existing levee. Construction of an adjacent setback levee would shift the jurisdictional levee landward, thereby providing more flexibility with respect to the management of structures and vegetation on the waterside slope. The adjacent setback levee would be constructed to provide the required freeboard and would include seepage remediation where required.

The selection of the seepage remediation measure(s) to be implemented at specific locations through Reaches 1 through 4B will be based on review and acceptance by the U.S. Army Corps of Engineers during the design and approval process.

Relief wells are also proposed to intercept underseepage and to pump it into the existing internal basin drainage system operated by Reclamation District 1000. Figure 13 depicts a typical relief well installation. Note that the slurry wall depicted in this figure is not a part of the proposed project component.

Construction of the adjacent setback levee requires the installation of a drainage collection system to gather runoff between the adjacent setback levee and the Garden Highway and to convey it under the Garden Highway, down the waterside slope to outlet structures. Drainage water would then be routed overland away from residences and through grass lined swales to the river channel. (Figure 14)

Utility pole relocations will be necessary at several locations along the Garden Highway. Figure 15 shows a typical plan for relocation of utility poles.

Construction Drawings and Specifications

Sixty percent submittal drawings and technical specifications without geotechnical reports were provided by SAFCA on November 21, 2007. While SAFCA is nearing completion of ninety percent submittal documents and delivery to the Board is anticipated shortly, staff will not be able to review or incorporate any information from the ninety percent submittal in time for the March 21 Board Meeting. Board staff will work with SAFCA to review the ninety percent submittal and to incorporate minor changes in the drawings and specifications into the final permit as necessary. Significant design changes will be brought back to the Board for approval at a future meeting.

The sixty percent construction drawings include an alignment plan and survey control points, seepage berm profile, aerial photos, borrow sites and test pit logs, plan and profile drawings, typical levee sections and details, cross section surveys, and other details.

The drawings also call for a fifty foot easement landward from the toe of the adjacent setback levee.

Local Agency Endorsement

Reclamation District (RD) 1000 is responsible for operating and maintaining the levees around the Natomas Basin. RD 1000 delivered its endorsement of the Sacramento River East Levee Phase I, Reaches 1 – 4B project to the Board on February 21, 2008. The endorsement and its conditions are incorporated into the draft permit as Attachment 1, Exhibit A.

DWR FloodSAFE California Early Implementation Program

SAFCA included the Sacramento River East Levee project in its original application for FloodSAFE funding to DWR. At present time only the Natomas Cross Canal components are planned for early implementation program funding approval during the State 2007-08 fiscal year.

If the Sacramento River proposal is eventually approved by DWR for FloodSAFE funding DWR may require the Board to include a permit condition stating that no work authorized by the permit shall be performed until the Board and DWR have received, reviewed, and approved in writing, a complete set of final (100 percent) project plans, drawings, specifications, and geotechnical data.

FloodSAFE geotechnical review of 100 percent project plans, drawings, specifications, and geotechnical data would likely be performed for DWR by its Division of Engineering.

U.S. Army Corps of Engineers Comments

The U.S. Army Corps of Engineers, Sacramento District Flood Protection and Navigation Section sent a formal 33 CFM Part 208.10 (a) (5) "no objections" letter to General Manager Punia on February 29, 2008. The letter and comments are incorporated into the draft permit as Attachment 1, Exhibit B and conditions.

The letter states that the District Engineer has no objection to a conditional approval of this application from a flood control standpoint subject to a future Section 408 approval ruling from USACE Headquarters, other standard construction and permitting conditions, and a statement that if the USACE disapproves the Section 408 request, the Board shall notify the applicant that the conditional permit is no longer valid.

The letter also states that a Section 10 and / or Section 404 permit application (2007-211) is in process.

Under section 33 CFR Part 208.10(a)(5) the District Engineer is required to determine that any proposed improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. This determination has historically been required before the Board can issue a permit for proposed activities affecting a federal flood control project.

Although the Board's prior Chief Engineer Stephen Bradley had related his concerns to the USACE in the past about the adequacy of this type of USACE 208.10 letter of no objections conditioned upon later Section 408 approval, the USACE Sacramento District staff has assured Board staff that they are in agreement with and support this process.

Note: Although the project description as written in the USACE letter includes a reference to seepage cutoff walls there are no cutoff walls included in the proposed project at this time. This language was based on SAFCA's initially submitted permit application but was later removed as part of a modified project description.

Hydraulic Analysis and Impacts

SRFCP Design

The Natomas Basin is part of the larger Sacramento River Flood Control Project, an integrated system of levee protected basins. The design water surface elevations for each basin in the SRFCP were based on flows and stages recorded during the floods of 1907 and 1909, and were specified in a design memorandum issued by the USACE in

1957, now commonly referred to as the "1957 profile". It is important to note that the design profile was not based on today's common statistical standards such as the 100-year (1 in 100, 1% chance of occurrence in any year) or the 200-year (1 in 200, 0.5% chance) flood events.

Throughout the 1900's the system capacity of the SRFCP was greatly expanded by the construction of five multiple purpose flood control reservoirs (Shasta, Black Butte, Oroville, New Bullards Bar, and Folsom) which provided 2.7 million acre-feet of dedicated flood storage.

The design included the assumption that no levee failures would occur, but that flood flows would be diverted through a combination of flood relief structures and fixed weirs into overflow areas and bypasses. Levee heights were set to be at least equal in height to the 1957 profile plus three to six feet of additional height (freeboard) to address hydrologic and engineering uncertainty and contain wind-driven waves.

Current federal law (44 CFR 65.10) requires urban basins to be protected by levees high enough to contain the computed water surface elevation produced by a 100-year flood plus an additional three feet of freeboard. Because of the participation of virtually all communities protected by segments of the SRFCP in the National Flood Insurance Program, the 100-year water surface profile must be considered.

In addition, the California Legislature has now established "200-year" flood protection as the appropriate standard of flood protection (Senate Bill 5, Statutes of 2008, Chapter 364) for all urban areas within the SRFCP, therefore the 200-year water surface profile must also be considered.

The existing levees protecting the Natomas Basin (including the Sacramento River east levee) are sufficiently high enough to contain a 200-year flood event, but without three feet of freeboard. Although not yet written into state law at this time, SAFCA anticipates that the State mandate for urban levee 200-year protection will ultimately require three feet of freeboard above the computed 200-year water surface profile with the assumption of no upstream levee failures. Thus SAFCA's designs include raising levees where necessary to provide at least three feet of freeboard above the 200-year profile.

SAFCA Hydraulic Analysis Background

SAFCA has publicly presented their hydraulic analysis in both Draft and Final EIRs and their Board permit applications. This analysis was performed using a modified version of the UNET one-dimensional unsteady flow model developed by the USACE for the Sacramento – San Joaquin Comprehensive Study.

The model was calibrated to reproduce the 1997 flood and is considered by many as one of the best available scientific tools for flood routing and water surface profile modeling work. SAFCA modeled 100- and 200-year flood flows through the

SRFCP for existing conditions without any NLIP improvements, and for future conditions with the proposed NLIP improvements in place. These flows and project conditions were also modeled with and without the authorized Folsom Dam modifications.

The most conservative (or worst case) computations of the 100- and 200-year water surface elevation profiles are made with the assumption that there are no upstream levee failures, consistent with the 1957 design assumptions. If modeled stages overtop the levees they are assumed to do so without causing failures, thus keeping a majority of the modeled flood flows in the canal and river channels.

A comparison of various peak flows in the Sacramento River downstream of the Natomas Cross Canal is provided in the following table.

Sacramento River	
1957 SRFCP design	107,000 cfs
1997 flood at Verona gage	102,000 cfs
100-year UNET simulation	112,000 cfs
200-year UNET simulation	141,000 cfs

Criteria to Determine Significant Hydraulic Impacts

SAFCA established its criteria for identifying significant hydraulic impacts at 0.1 feet (1.2 inches) of computed increase in water surface elevations when comparing existing conditions to proposed project conditions at the 1957, 100-year, and 200-year target design flows.

Landside Levee Raises, Adjacent Setback Levees and Seepage Berms

SAFCA states that since the landside improvements proposed for the Sacramento River East Levee do not directly alter the hydraulic cross section, the flow-carrying ability of the Sacramento River would not be negatively impacted by the proposed landside improvements.

UNET model analysis confirmed that there are no direct adverse hydraulic impacts on the SRFCP due to proposed landside improvements for modeled flows at the 1957 design, 100-year, or 200-year design levels. Board staff agrees with this conclusion.

Drainage Collection System along the Garden Highway

The proposed system will capture and divert runoff (primarily rainfall) that falls along the Garden Highway between the existing roadway crown and the westerly hinge point of the proposed adjacent setback levee. Under existing conditions this runoff is collected by the internal drainage collection system operated by Reclamation District 1000 and eventually pumped into the Sacramento River. The impact of the proposed

collection system would be to more quickly collect and divert this portion of the runoff into the Sacramento River.

While this impact has not been quantified Board staff considers it to be insignificant. At most any impact on Sacramento River water surface profiles would be modeled as a slight increase in the timing of rising river stages at the onset of a water surface rise and not in the peak magnitude of a flood event.

SAFCA's DEIR further states that no aspects of the Natomas Basin drainage system would be affected by 2008 construction, and that no substantial alteration of drainage patterns or disruption of drainage systems would result from the proposed project as a result of the elements proposed for 2008 construction.

Concerns of Adjacent Levee Maintaining Agencies and Residences

Several local maintaining agencies maintain and operate levees protecting the primarily agricultural basins adjacent to the Natomas Basin. Two agencies, RD 1001 and RD 2035 submitted comments to SAFCA's draft EIR (FEIR letters 12 and 13).

RD 2035, the local maintaining agency for lands within and west of the Yolo Bypass between the cities of Davis and Woodland, also submitted comments to the DEIR stating that SAFCA's analysis *"… creates an increased risk of flooding to lands on the opposite side of the Sacramento River…"*.

Numerous public and private responses were also submitted to SAFCA expressing concerns about hydraulic impacts. Additionally the Board received several letters from citizens along the Garden Highway expressing their concerns or protests to the NLIP.

Board Request for Additional Hydraulic Profile Results

In general, SAFCA's modeling results presented in the DEIR and EIR did not provide direct comparisons between the 1957 SRFCP design and the computed water surface profiles for 100-year or 200-year flood events.

In an effort to better portray and quantify SAFCA's hydraulic impact analysis, and to foster an improved understanding of the impacts of proposed increases in the design level of flood protection, Board staff requested SAFCA at the December 21, 2007 Board meeting to prepare additional water surface profile elevation plots to clearly depict the differences between the 1957 design and the 100-year and 200-year design levels.

The water surface profile plots were provided and are included in Attachment 4. They include:

- Sacramento River East Levee – Mile 95 to American River
- Sacramento River West Levee – Mile 95 to American River
- Sacramento River East Levee – American River to Freeport
- Sacramento River West Levee – American River to Freeport

These plots clearly depict the computed differences in water surface elevation computed by the hydraulic model. They also show where water surface profiles are in excess of the existing top of levee. Locations outside the Natomas Basin where the current top of levee would be exceeded by a 100-year or 200-year flood event can be quickly summarized as follows:

- Sacramento River east levee: two locations upstream of Fremont Weir; one possible location just below the Natomas Cross Canal; and just downstream of the I Street Bridge at Sacramento
- Sacramento River west levee: locations upstream of Fremont Weir; portions of the reach from opposite the mouth of the Natomas Cross Canal downstream to about River Mile 74; and a short section just downstream of River Mile 59 in West Sacramento

While these plots do not show all details, including how high the levees would have to be to pass a 200-year event with three feet of freeboard, they do verify the need for comprehensive system-wide analysis and planning as mandated by late 2007 flood legislation. This work will be performed by DWR to produce a new State Plan of Flood Control which will in turn be adopted by the Board.

Hydraulic Mitigation

The State Legislature authorized SAFCA's 200-year flood protection program in Senate Bill 276, October 2007 (Attachment 5) and adopted findings that the NLIP would not result in any adverse hydraulic impacts to other basins outside of Natomas protected by the SRFCP. The Legislature further restricted the Board from requiring SAFCA to mitigate for hydraulic impacts.

SB 276, Section 1(l) amended Section 12670.14 of the Water Code and stated that:

(l) The projects authorized in Section 12670.14 of the Water Code will increase the ability of the existing flood control system in the lower Sacramento Valley to protect heavily urbanized areas within the City of Sacramento and the Counties of Sacramento and Sutter against very rare floods without altering the design flows and water surface elevations prescribed as part of the Sacramento River Flood Control Project or impairing the capacity of other segments of the Sacramento River Flood Control Project

to contain these design flows and to maintain water surface elevations. Accordingly, the projects authorized in that section will not result in significant adverse hydraulic impacts to the lands protected by the Sacramento River Flood Control Project and neither the Reclamation Board nor any other state agency shall require the authorized projects to include hydraulic mitigation for these protected lands.

CEQA Compliance

SAFCA's Draft Environmental Impact Report (DEIR) on the NLIP Landside Improvements Project (State Clearinghouse #2007062016) was issued for public review and comment on September 14, 2007. The DEIR is available for viewing or downloading from SAFCA's website at http://www.safca.org/documents/FullDEIR_002.pdf.

A Final EIR (FEIR) was completed in November 2007 and was certified by the SAFCA Board of Directors in November 2007. The FEIR is incorporated into this report as Reference 1 and is also available for viewing or downloading from SAFCA's website at http://www.safca.org/documents/NLIPFEIR11.19.07.pdf

These EIRs addressed SAFCA's comprehensive flood control improvements for the Sacramento metropolitan area at a programmatic level, and they included a project-level analysis of the first phase of the improvements for the Sacramento River east levee reaches 1 – 4B proposed for 2008 construction.

In addition to the FEIR two other SAFCA documents are incorporated into this report as References 2 and 3 and are labeled as follows:

- *Exhibit B, Mitigation Monitoring and Reporting Program for the Natomas Levee Improvement Program Landside Improvements Project, November 2007 (Available on SAFCA's website at http://www.safca.org/documents/LandsideMMRP112107.pdf*

- *Item 1, SAFCA Agenda of November 29, 2007, Subject: Resolution 07-105 – Natomas Levee Improvement Program.*

As part of the certification process, the SAFCA Board adopted findings, including a statement of overriding considerations with respect to all of the significant adverse impacts identified in the FEIR; adopted mitigation measures and a mitigation monitoring and reporting program for these impacts; and approved the levee improvement work proposed to be undertaken in 2008 which included the Sacramento River East Levee Phase I Improvements.

Board environmental staff reviewed the DEIR, FEIR and other related documents. As part of the DEIR comment process staff submitted two comment letters (FEIR Letters 2 and 3) to SAFCA on September 19, 2007 and October 28, 2007

respectively. Letter 2 addressed the potential need for a Board encroachment permit while Letter 3 further discussed the need for a permit, Board regulations, global climate change, consequences of urban development, storm water pollution protection planning, future landside encroachments, loss of riparian habitat, loss of agricultural lands, construction methods, and other issues. SAFCA responses 3-1 through 3-11 in the FEIR addressed these concerns.

Staff has prepared Board Resolution 2008-04 (Attachment 6) for Board consideration to formally adopt SAFCA's CEQA findings.

Staff Recommendations

Staff recommends that the Board approve permit application No. 18159-3 BD for the project subject to final permit approval conditioned upon:

1. receiving USACE 33 USC Section 408 approval to alter a portion of the Sacramento River Flood Control Project (the Board approved sending the 408 request to USACE at the January 2008 Board meeting);

2. The Board will adopt findings on the Final EIR by approving draft Resolution 2008-04.

Resolution 2008-04 includes findings as now required by Section 8610.5 of the Water Code (added by Senate Bill 17, October 2007) that during the evidentiary hearing the Board considered the following:

1. evidence presented from any party, State or local public agency, or nongovernmental organization with expertise in flood or floodplain management;

2. the best available science relating to the issues presented by all parties;

3. effects of the proposed decision on the entire State Plan of Flood Control;

4. effects of reasonably projected future events, including but not limited to, changes in hydrology, climate, and development within the applicable watershed.

Figures, Attachments, and References

List of Figures

1. NLIP Project Component Map
2. Reclamation District 1000 Map
3. Overview of Proposed Project Features (Reaches 1 – 10)
4. Overview of Proposed Project Features (Reaches 10 - 20B)
5. Sacramento River East Levee Features (1 of 4)
6. Sacramento River East Levee Features (2 of 4)
7. Sacramento River East Levee Features (3 of 4)
8. Sacramento River East Levee Features (4 of 4)
9. Levee Reaches with Freeboard Deficiencies
10. Levee Reaches Requiring Underseepage Remediation
11. Typical Levee Seepage Mechanisms
12. Setback Levee Concept
13. Typical Relief Well
14. Typical Garden Highway Drainage Pipe
15. Typical Utility Pole Relocation

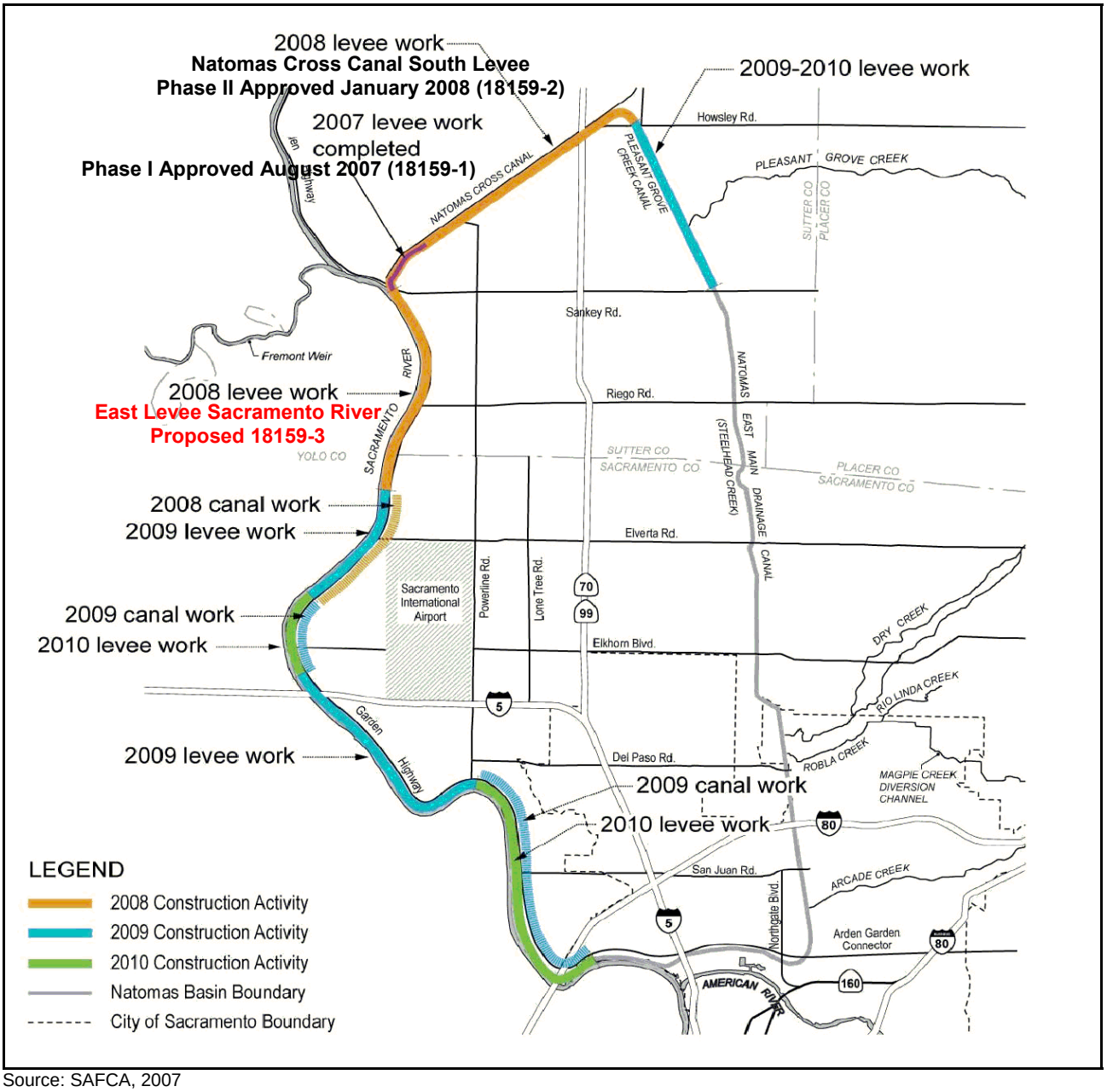
List of Attachments

1. Draft Permit No. 18159-3 BD
2. Natomas Levee Improvement Program History
3. Copy of 33 USC Section 408 Request Letter, January 2008
4. Water Surface Profiles from Hydraulic Analysis, January 2008
5. Senate Bill 276, October 2007
6. Board Resolution 2008-04

List of References (Provided by SAFCA)

1. SAFCA Final Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvement Projects, State Clearinghouse # 2007062016, November 2007
2. SAFCA Final EIR Exhibit B, Mitigation Monitoring and Reporting Program for the Natomas Levee Improvement Program Landside Improvements Project, November 2007
3. SAFCA Board Resolution 07-105 – Natomas Levee Improvement Program, SAFCA Board Meeting Agenda Item 1, November 29, 2007

Figure 1 – NLIP Project Component Map



Source: SAFCA, 2007

Figure 2 – Reclamation District 1000 Map

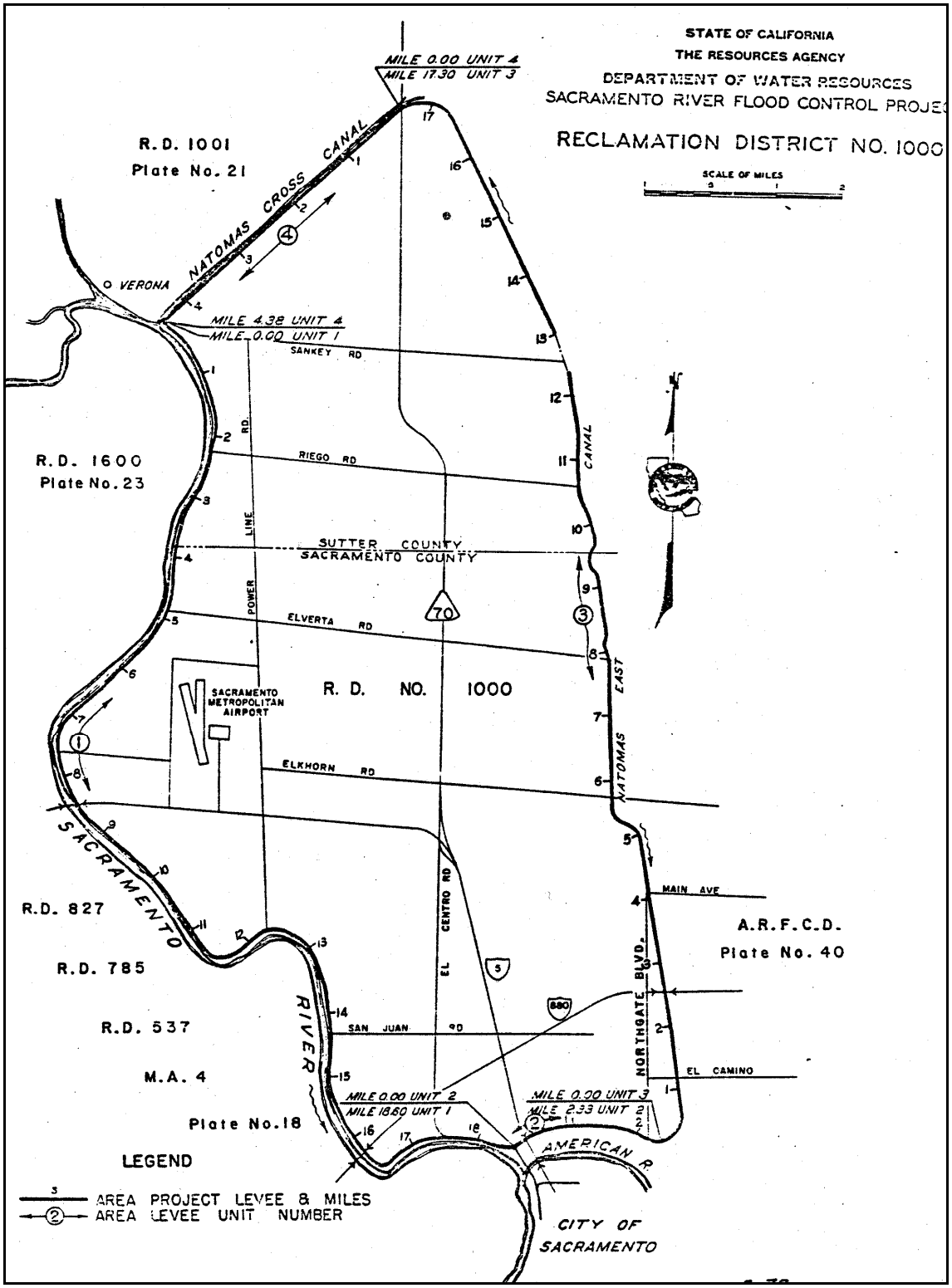
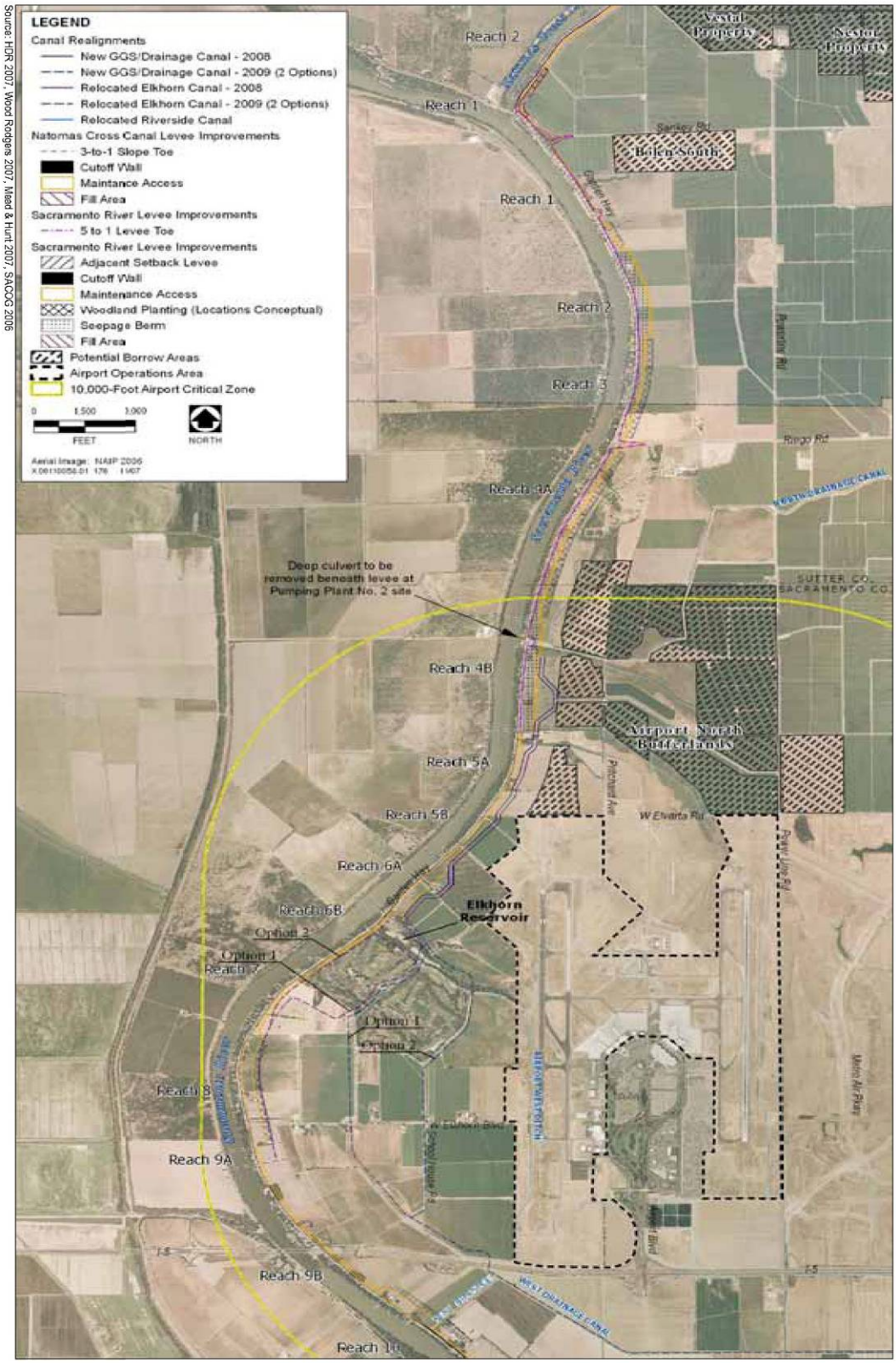


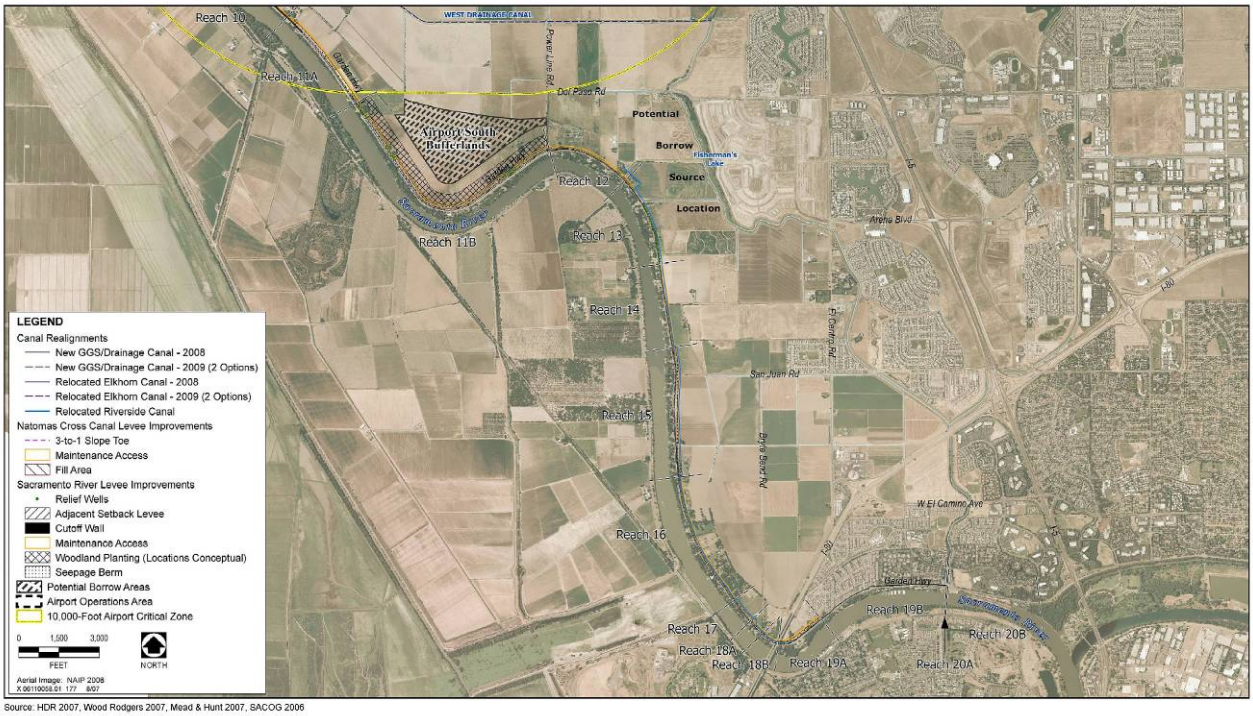
Figure 3 – Overview of Proposed Project Features (Reaches 1 – 10)



Overview of Proposed Project Features (2008–2010 Construction)—Map 2 of 3

Exhibit 1-2b

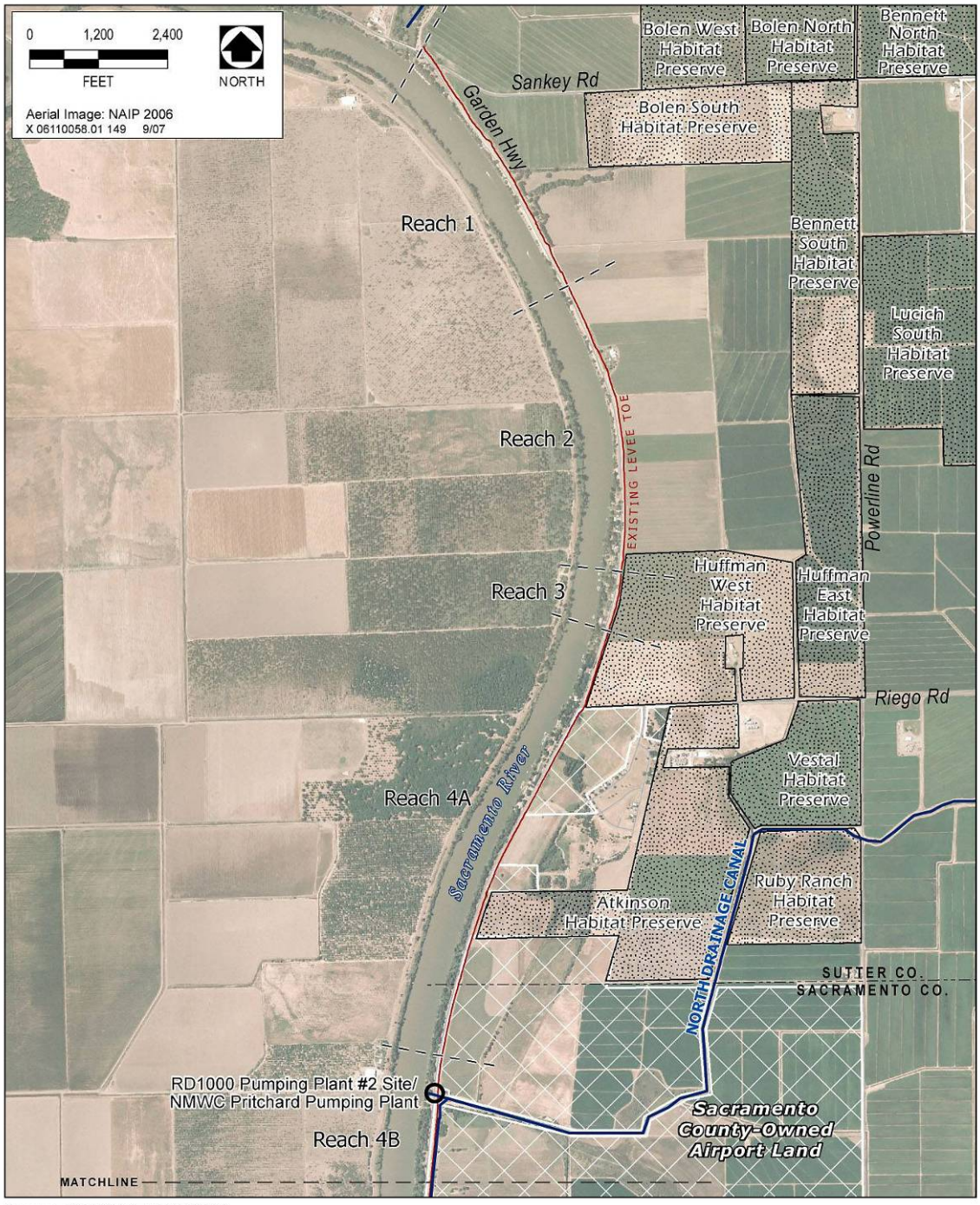
Figure 4 – Overview of Proposed Project Features (Reaches 10 - 20B)



Source: HDR 2007, Wood Rodgers 2007, Mead & Hunt 2007, SACOG 2006

Overview of Proposed Project Features (2008-2010 Construction) – Map 3 of 3 **Exhibit 2-8c**

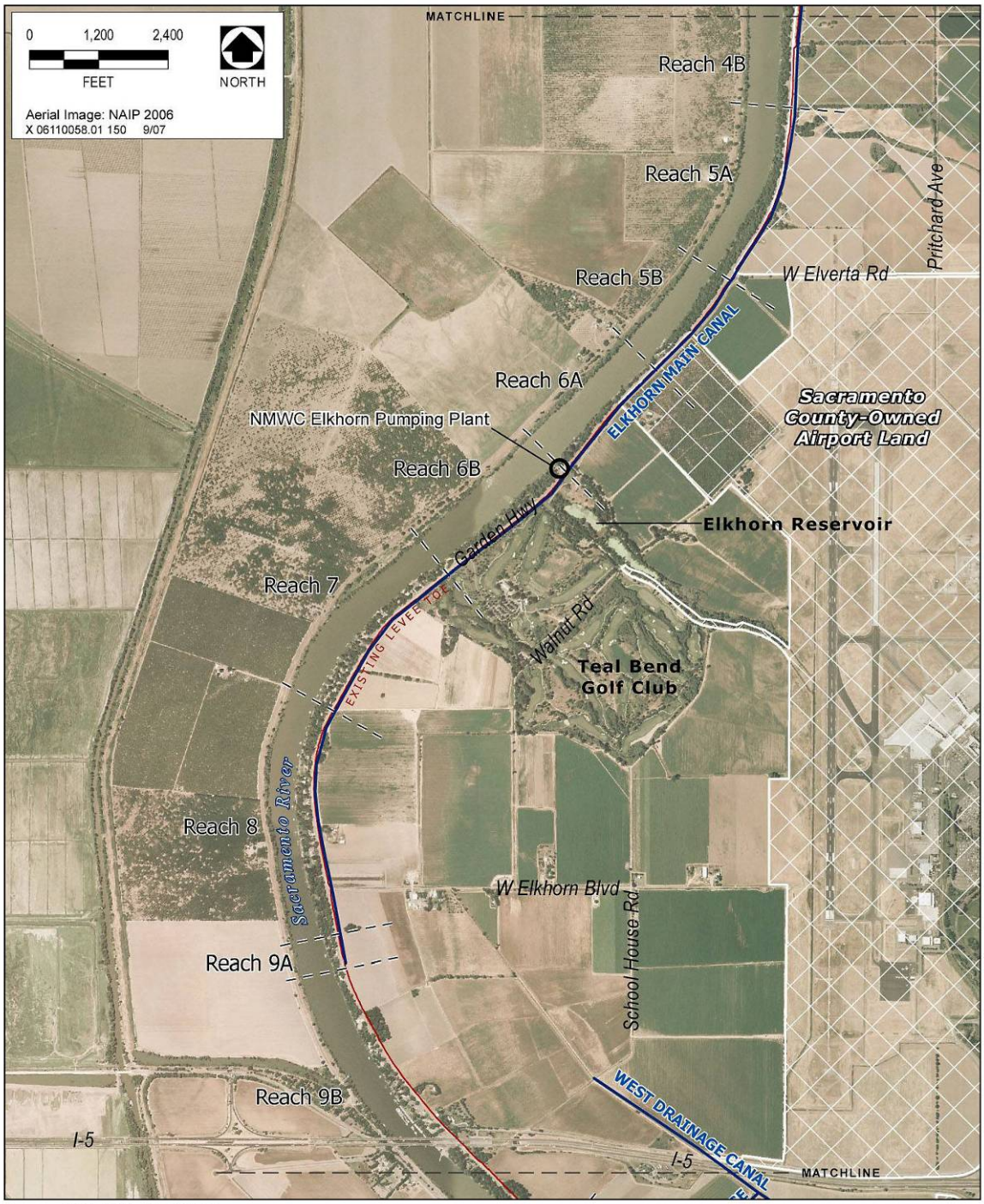
Figure 5 – Sacramento River East Levee Features (1 of 4)



Source: HDR 2007, EDAW 2007

Setting of the Sacramento River East Levee – Map 1 of 4 **Exhibit 2-10a**

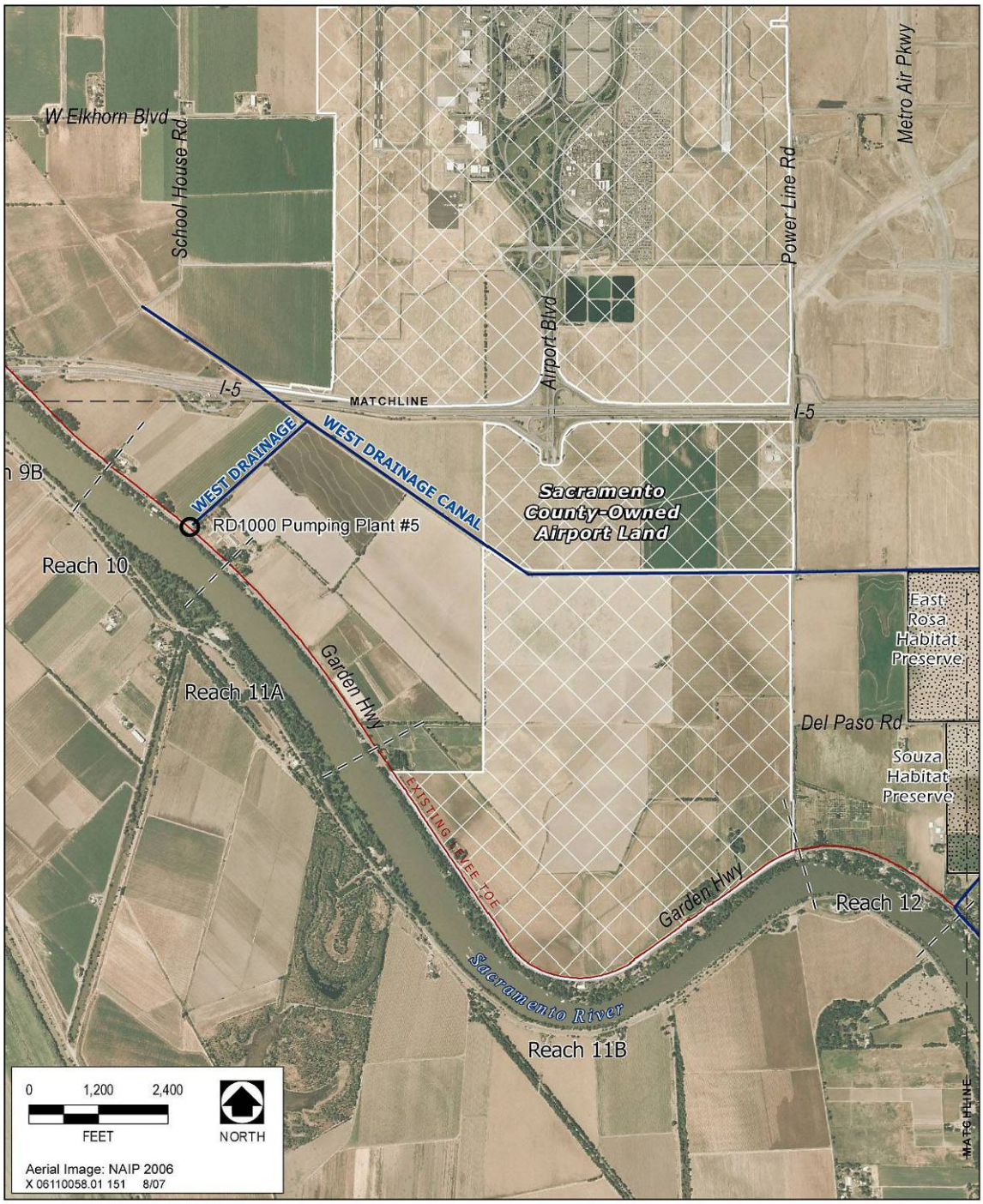
Figure 6 – Sacramento River East Levee Features (2 of 4)



Source: HDR 2007, EDAW 2007

Setting of the Sacramento River East Levee – Map 2 of 4 **Exhibit 2-10b**

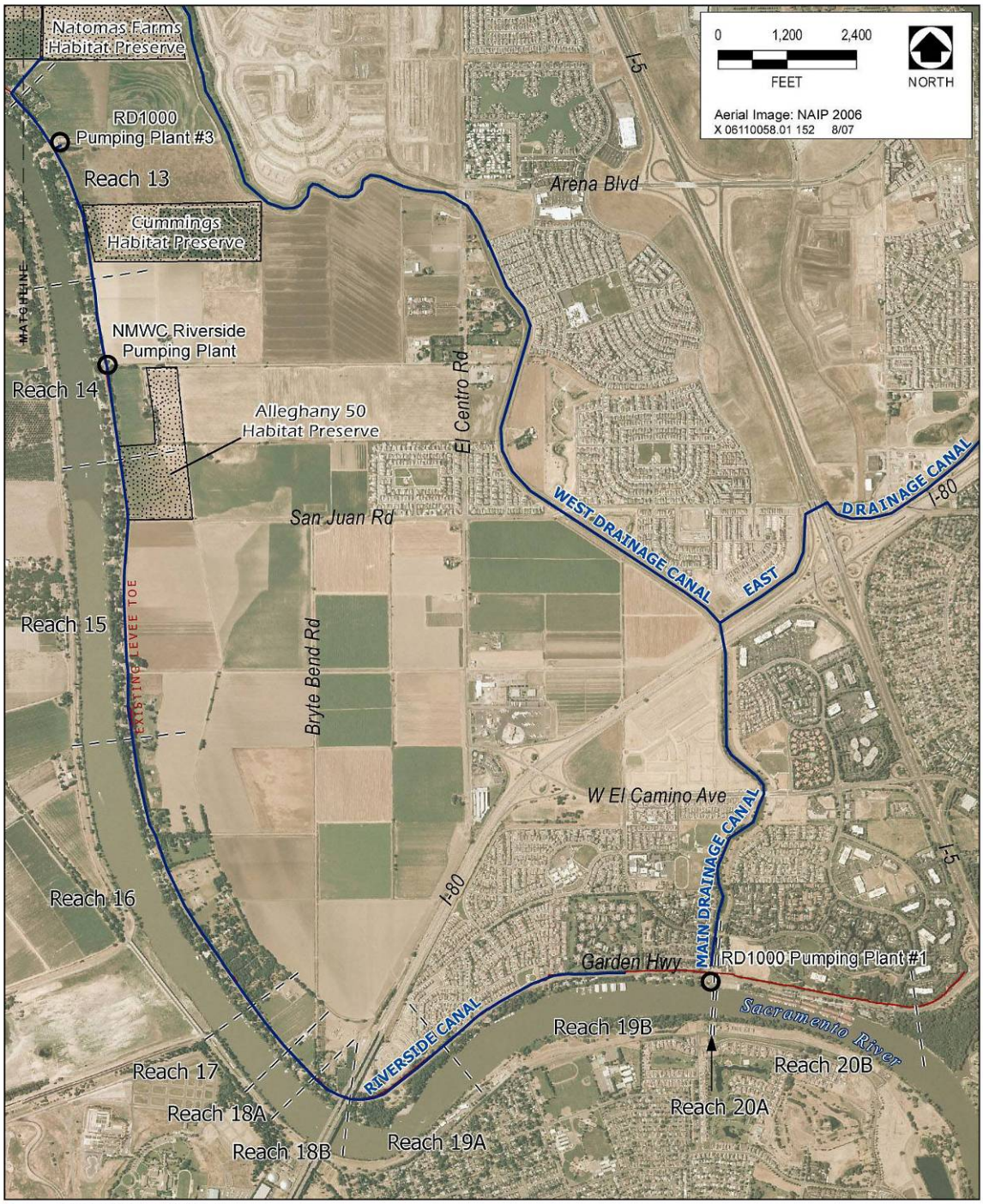
Figure 7 – Sacramento River East Levee Features (3 of 4)



Source: HDR 2007, EDAW 2007

Setting of the Sacramento River East Levee – Map 3 of 4 **Exhibit 2-10c**

Figure 8 – Sacramento River East Levee Features (4 of 4)



Source: HDR 2007, EDAW 2007

Setting of the Sacramento River East Levee – Map 4 of 4 **Exhibit 2-10d**

Figure 9 –Levee Reaches with Freeboard Deficiencies

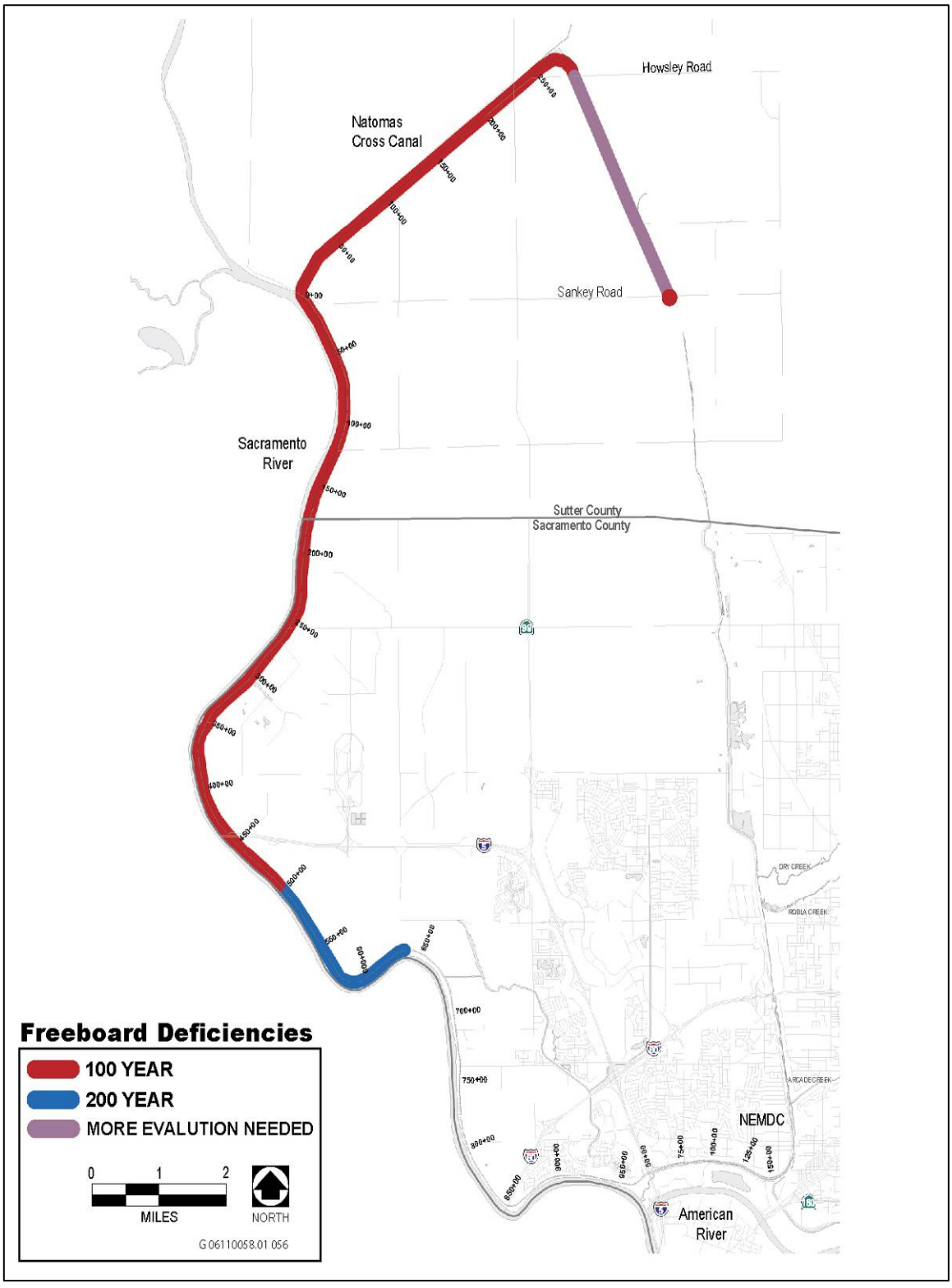
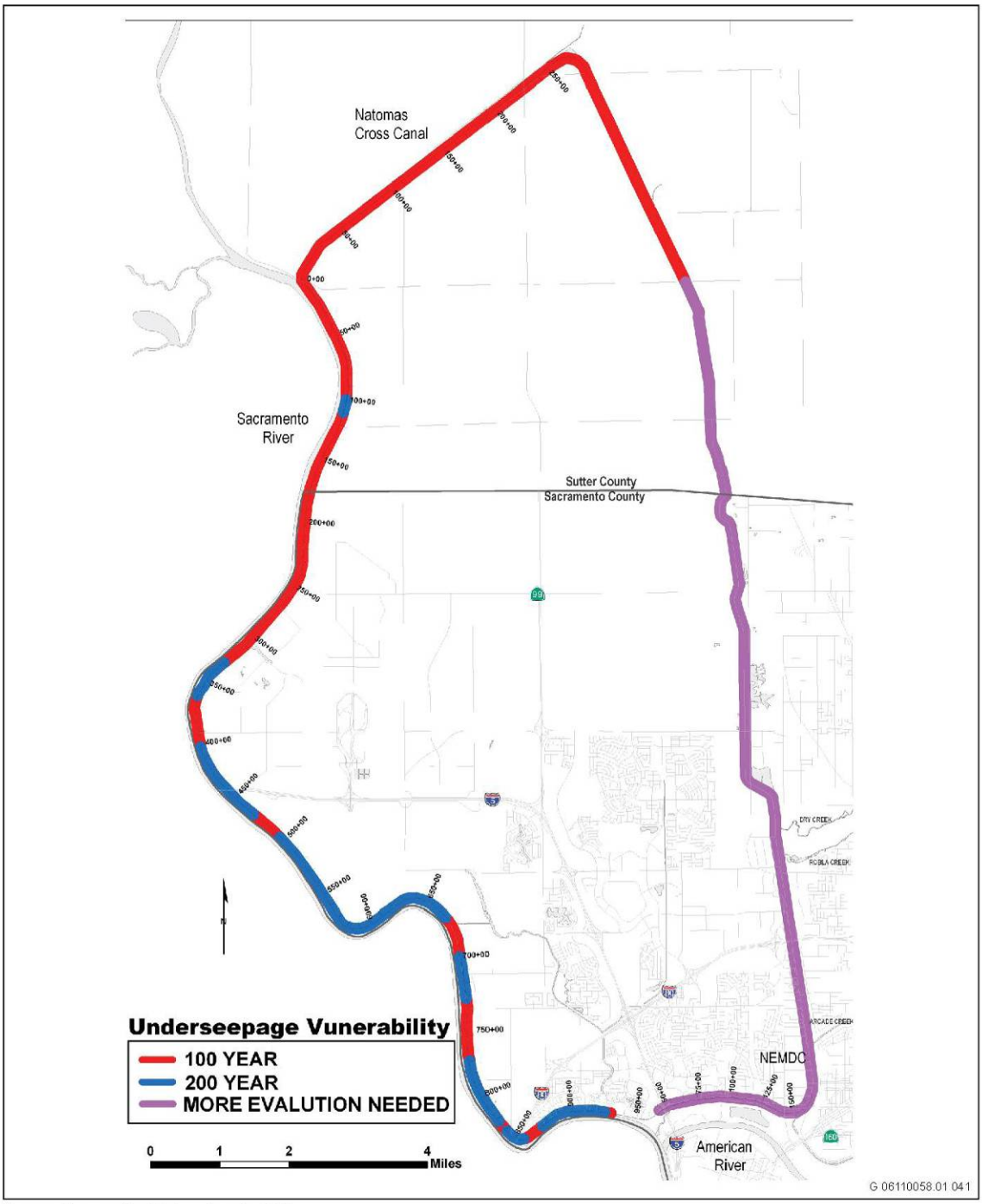


Figure 10 –Levee Reaches Requiring Underseepage Remediation



Source: Prepared by PB Americas in 2007

Levee Reaches Requiring Underseepage Remediation **Exhibit 2-5**

Figure 11 – Typical Levee Seepage Mechanisms

: Prepared by Jones & Stokes in 2007

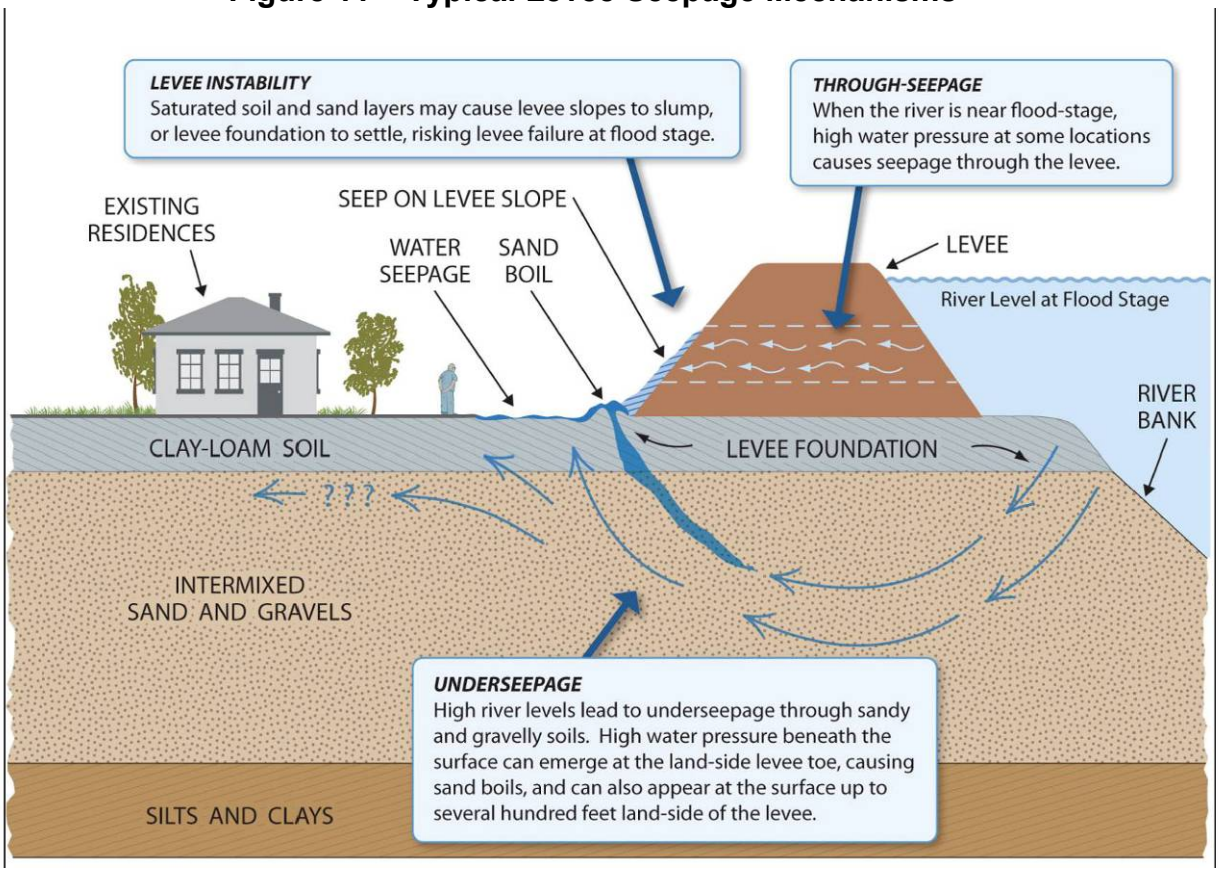


Figure 12 – Setback Levee Concept

Source: HDR 2007, Adapted by EDAW in 2007

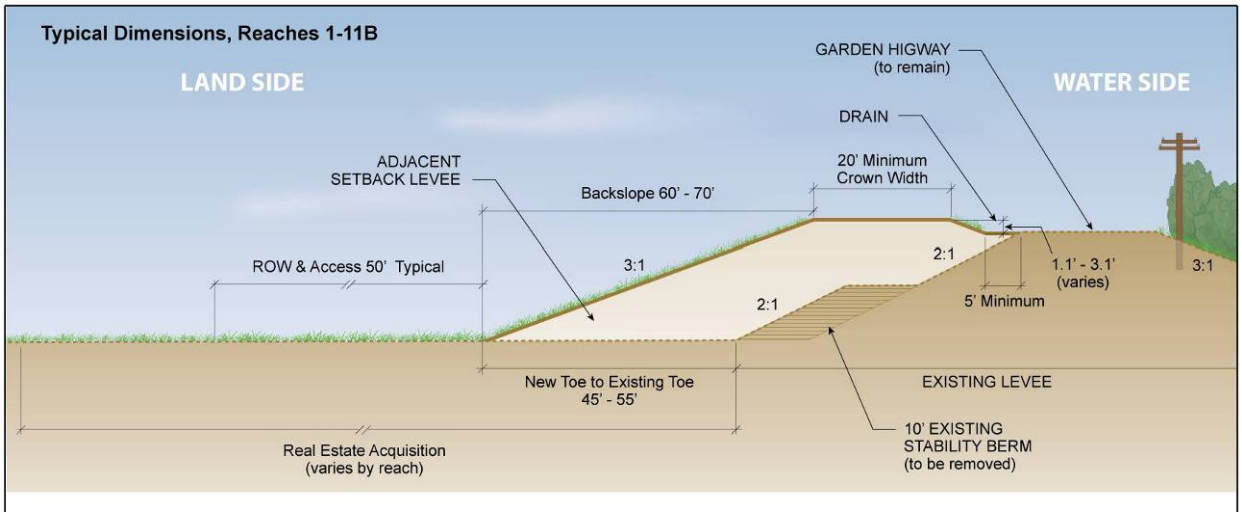


Figure 13 – Typical Relief Well

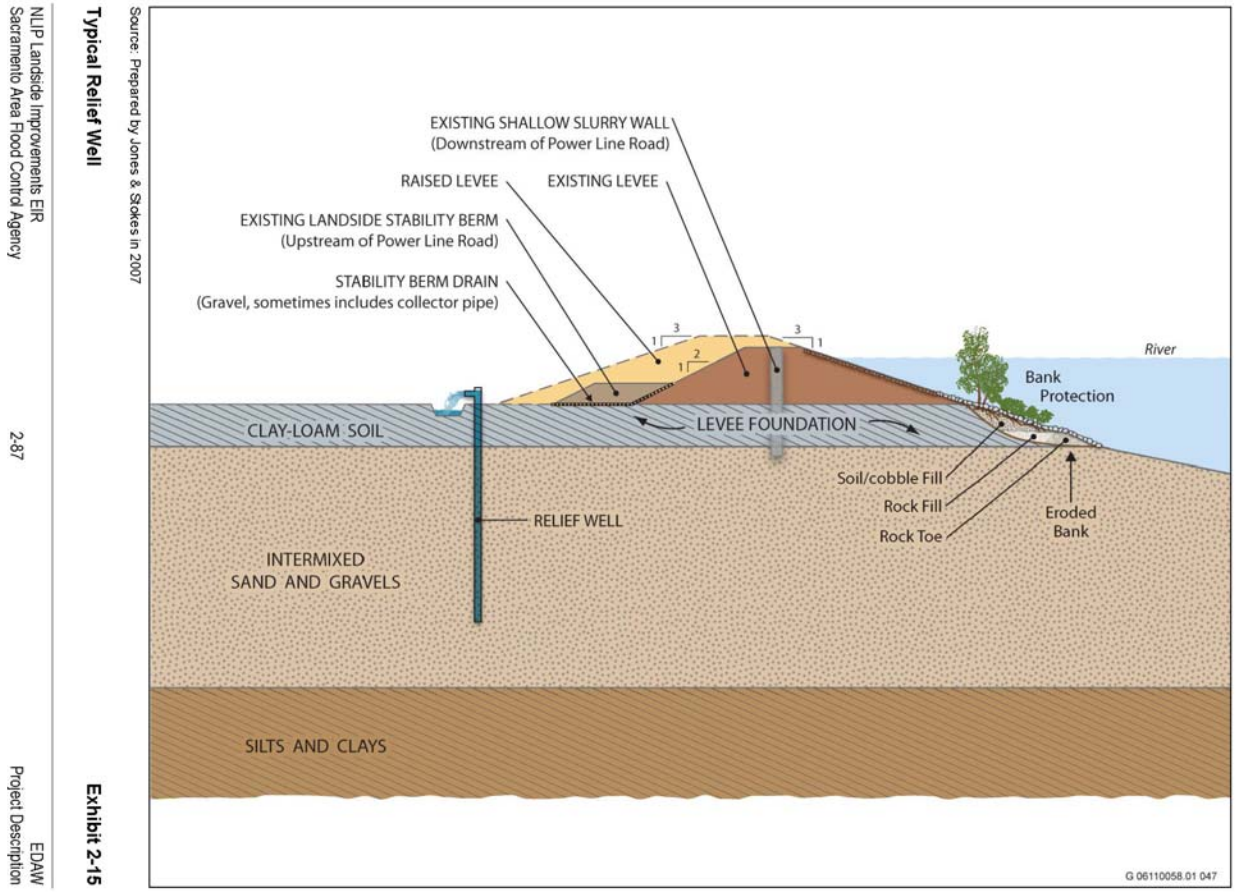


Figure 14 – Typical Garden Highway Drainage Pipe

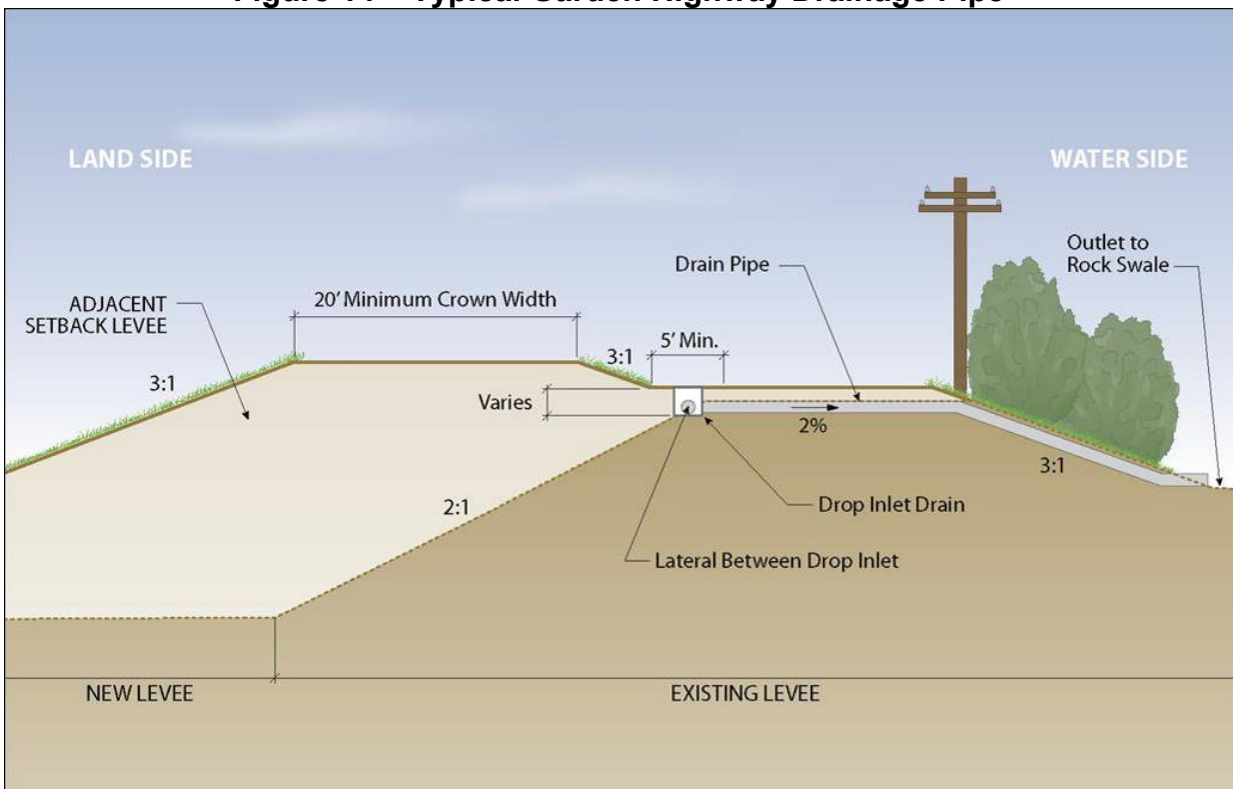
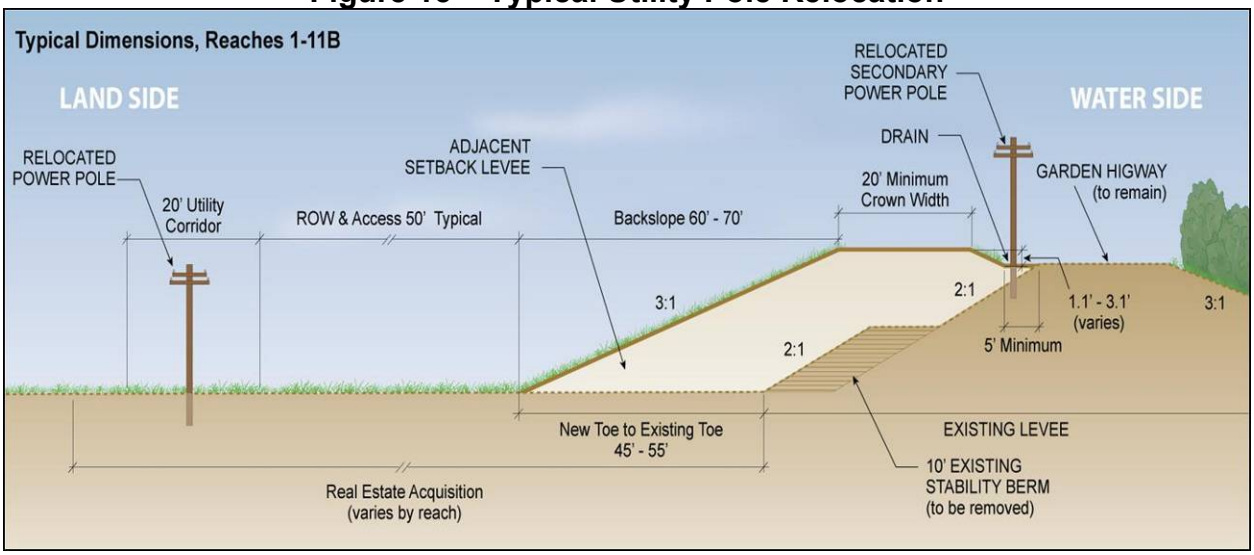


Figure 15 – Typical Utility Pole Relocation



Attachment 1

Draft Permit No. 18159-3 BD

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18159-3 BD

This Permit is issued to:

Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, California 95814

To place fill and construct seepage remediation measures, including seepage berms and relief wells along approximately 22,800 linear feet of the landside slope of the left (east) bank levee of the Sacramento River. The project is located in Sacramento, between the Natomas Cross Canal and Elverta Road on the Garden Highway (Section 1,12,13, T10N, R3E, MDB&M, Reclamation District 1000, Sacramento River, Sacramento/Sutter County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and the Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right

to change any conditions in this permit as may be consistent with current flood control standards and policies of the Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 day's notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by the Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of the Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18159-3 BD

THIRTEEN: Construction under this permit shall not occur until the Army Corps of Engineers approves the project under 33 USC Section 408. All conditions from section 408 approval provided by the Corps of Engineers shall be incorporated into this permit as if fully set forth herein if they are not in conflict with the Central Valley Flood Protection Board's regulations (Title 23 California Code of Regulations).

FOURTEEN: No work authorized by this permit shall be performed until the Central Valley Flood Protection Board and Department of Water Resources have received, reviewed, and approved in writing, a complete set of final submitted plans, drawings, and specifications for the project. The Central Valley Flood Protection Board shall have up to 90 days after receipt of plans, drawings, and specifications for the review process. The Central Valley Flood Protection Board and/or the Department of Water Resources may extend this review period by written notification.

FIFTEEN: All addendums or other changes made to the submitted documents by the permittee after issuance of this permit are subject to submittal and review for approval by the Central Valley Flood Protection Board prior to incorporation into the permitted project. Upon review and approval of any new submitted documents the permit shall be revised, if needed, prior to construction related to the proposed changes. The Central Valley Flood Protection Board shall have up to 90 days after receipt of any documents, plans, drawings, and specifications for the review process. The Central Valley Flood Protection Board and/or the Department of Water Resources may extend this review period by written notification.

SIXTEEN: The mitigation measures approved by the permittee and found in its Mitigation and

Monitoring Reporting Plan (MMRP) are made a condition of this permit. The permittee shall implement all such mitigation measures. However, the measures in the MMRP may be modified to accommodate changed circumstances or new information not triggering the need for subsequent or supplemental analysis under CEQA Guidelines sections 15062 or 15063 with advance notice of the proposed changes and submittal of supporting documentation for review and comment to the Staff Environmental Scientist of the Central Valley Flood Protection Board.

SEVENTEEN: The permittee shall comply with all conditions set forth in the conditions page from Reclamation District No. 1000 received February 21, 2008, which is attached to this permit as Exhibit A and is incorporated by reference.

EIGHTEEN: The permittee shall comply with all conditions set forth in the letter from the Department of the Army dated February 20, 2008, which is attached to this permit as Exhibit B and is incorporated by reference.

NINETEEN: This permit is not valid until the permittee has resolved condition (a.) provided by the Corps of Engineers in Exhibit B.

TWENTY: Within three years from completion of the construction of the work authorized under this permit, the permittee shall provide the Sacramento and San Joaquin Drainage District, acting by and through the Central Valley Flood Protection Board of the State of California, a permanent easement granting all flood control rights upon, over and across the property to be occupied by the existing or to-be-reconstructed levee, including the area of the levee raise and realignment fill areas. The easement must include the area within the floodway, the levee section, and the area fifty (50) feet in width adjacent to the existing and new landward levee toes if the area is not presently encumbered by a Central Valley Flood Protection Board easement. For information regarding existing Central Valley Flood Protection easements and required easements, please contact Linus Paulus at (916) 653-3947.

TWENTY-ONE: All work approved by this permit shall be in accordance with the final (100%) submitted drawings and specifications except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central Valley Flood Protection Board.

TWENTY-TWO: Prior to commencement of excavation, the permitte shall create a photo record, including associated descriptions, of the levee conditions. The photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer registered in the State of California and submitted to the Central Valley Flood Protection Board within 30 days of beginning the project.

TWENTY-THREE: Upon completion of the project, the permittee shall perform a levee crown profile survey and create a photo record, including associated descriptions, of "as-buillt" levee conditions. The levee crown profile survey and photo record shall be certified (signed and stamped) by a licensed land surveyor or a professional engineer registered in the State of California and submitted to the Central Valley Flood Protection Board within 120 days of project completion.

TWENTY-FOUR: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of

the Department of Water Resources, Reclamation District No. 1000 or any other agency responsible for maintenance.

TWENTY-FIVE: The permittee shall contact the Department of Water Resources by telephone, (916) 574-1213, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project.

TWENTY-SIX: Prior to starting construction under this permit, the permittee shall contact the Department of Water Resources regarding inspection of the project during construction.

TWENTY-SEVEN: The permittee shall provide supervision and inspection services acceptable to the Central Valley Flood Protection Board.

TWENTY-EIGHT: Within120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board a certification report, stamped and signed by a professional civil engineer registered in the State of California, certifying the work was inspected and performed in accordance with the Central Valley Flood Protection Board permit conditions and submitted drawings and specifications.

TWENTY-NINE: If FEMA certification of the leveee by the Corps of Engineers is being considered, the project proponent should contact the U. S. Army Corps of Engineers regarding inspection of the project during construction for FEMA certification purposes.

THIRTY: The permittee shall contact the U. S. Army Corps of Engineers regarding inspection of the project during construction as the proposed work is an alteration to the existing Federal Flood Control Project that will be incorporated into the Sacramento River Flood Control Project, an adopted plan of flood control.

THIRTY-ONE: The Central Valley Flood Protection Board, Department of Water Resources and Reclamation District No. 1000 shall not be held liable for any damages to the permitted encroachment(s) resulting from flood fight, operation, maintenance, inspection, or emergency repair.

THIRTY-TWO: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

THIRTY-THREE: The permittee should contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act may be required.

THIRTY-FOUR: The permittee shall be responsible for repair of any damages to the project levee and other flood control facilities due to construction, operation, or maintenance of the proposed project.

THIRTY-FIVE: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend and hold harmless the State of California, or

any departments thereof, from any liability or claims of liability associated therewith. This permit is not valid until the Sacramento Area Flood Control Agency provides written assurances satisfactory to the Central Valley Flood Protection Board that the Sacramento Area Flood Control Agency will defend, indemnify and hold the board and State of California, including its agencies, departments, boards, and commissions, and their respective officers, agents, employees, successors and assigns, safe and harmless, of and from all claims and damages arising out of the project undertaken pursuant to this permit, and to discharge this obligation to the extent allowed by law.

THIRTY-SIX: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's or successor's cost and expense.

THIRTY-SEVEN: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board proposed revision to the Corps of Engineers, Supplement to Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, Unit 124 and the associated "as-built" drawings for system alterations approved by Exhibit B that are to be incorporated into the federal Sacramento River Flood Control Project.

THIRTY-EIGHT: No construction work of any kind shall be done during the flood season from November 1 to April 15 without prior approval of the Central Valley Flood Protection Board.

THIRTY-NINE: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

FORTY: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15.

FORTY-ONE: The permitted encroachment(s) shall not interfere with operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's expense.

FORTY-TWO: The permittee shall cooperate with the Board to ensure that any encroachment that must be relocated, modified or otherwise altered to accommodate construction of the improvements permitted herein is relocated, modified or otherwise altered in a manner that complies with current applicable state and federal standards. If the affected encroachment has an existing Board permit or is subject to some other applicable Board authorization, the permittee shall cooperate with the Board to ensure the permit or other authorization is appropriately amended to reflect the changed condition as shown on as-built drawings for the encroachment and the overall project. If the encroachment does not have a Board permit or other Board authorization, the permittee shall cooperate with the Board to determine whether a Board permit is required. If so, permittee shall cooperate with the Board to ensure that required permit application is made and, if granted, the permit reflects the changed condition as shown on as-built drawings for the encroachment and the overall project.

FORTY-THREE: During construction of the project, any and all anticipated or unanticipated conditions encountered which may impact levee integrity or flood control shall be brought to the attention of the Flood Project Inspector immediately and prior to continuation. Any encountered abandoned encroachments shall be completly removed or properly abandoned under the direction of the Flood Project Integrity and Inspection Branch Inspector.

FORTY-FOUR: The stability of the levee shall be maintained at all times during construction.

FORTY-FIVE: Excavations below the design flood plane and within the levee section or within 10 feet of the projected waterward and landward levee slopes shall have side slopes no steeper than 1 horizontal to 1 vertical. Flatter slopes may be required to ensure stability of the excavation.

FORTY-SIX: A profile of the levee crown roadway and access ramp that will be utilized for access to and from the borrow areas shall be submitted to the Central Valley Flood Protection Board prior to commencement of excavation.

FORTY-SEVEN: The haul ramps and utilized levee crown roadway shall be maintained in a manner prescribed by the authorized representative of the Department of Water Resources, Reclamation District No. 1000 or any other agency responsible for maintenance.

FORTY-EIGHT: Any damage to the levee crown roadway or access ramps that will be utilized for access for this project shall be promptly repaired to the condition that existed prior to this project.

FORTY-NINE: The permittee shall be responsible for all damages due to settlement, consolidation, or heave from any construction-induced activities.

FIFTY: All fencing, gates and signs removed during construction of this project shall be replaced in kind and at the original locations. If it is necessary to relocate any fence, gate or sign, the permittee is required to obtain written approval from the Central Valley Flood Protection Board prior to installation at a new location if not shown on the submitted drawings.

FIFTY-ONE: All temporary fencing, gates and signs shall be removed upon completion of project.

FIFTY-TWO: Any pipe or conduit being reinstalled in the levee section and within fifty (50) feet of both the waterward and landward levee toes shall meet Title 23 standards.

FIFTY-THREE: Fill on the levee slopes shall be keyed into the existing levee section with each lift.

FIFTY-FOUR: Backfill material for excavations within the levee section and within fifty (50) feet of the levee toes shall be placed in 4- to 6-inch layers, moisture conditioned above optimum moisture content, and compacted to a minimum of 90 percent relative compaction as measured by ASTM Method D1557-91.

FIFTY-FIVE: Density tests by a certified materials laboratory will be required to verify compaction of backfill within the levee section and within fifty (50) feet of the levee toes.

FIFTY-SIX: Earthen material meeting the requirements of Condition Fifty-Nine shall be used when constructing or reconstructing the waterside levee slope, levee crown and landside fill areas, and no

cuts shall remain in the levee section upon completion.

FIFTY-SEVEN: The slopes of the proposed levee shall be no steeper than 3 horizontal to 1 vertical on the water side and 2 horizontal to 1 vertical on the land side.

FIFTY-EIGHT: Fill material shall be placed only within the area indicated on the approved plans.

FIFTY-NINE: All fill material shall be imported impervious material with 20 percent or more passing the No. 200 sieve, a plasticity index of 8 or more, and a liquid limit of less than 50 and free of lumps or stones exceeding 3 inches in greatest dimension, vegetative matter, or other unsatisfactory material.

SIXTY: The fill surface area shall be graded to direct drainage away from the toe of the levee.

SIXTY-ONE: Where appropriate the new and reconstructed levee crown roadway and access ramps shall be surfaced with a minimum of 4 inches of compacted, Class 2, aggregate base (Caltrans Specification 26-1.02A).

SIXTY-TWO: Aggregate base material shall be compacted to a relative compaction of not less than 95 percent per ASTM Method D1557-91, with a moisture content sufficient to obtain the required compaction.

SIXTY-THREE: Revetment shall be uniformly placed and properly transitioned into the bank, levee slope, or adjacent revetment and in a manner which avoids segregation.

SIXTY-FOUR: Revetment shall be quarry stone and shall meet the following grading:

Quarry Stone

Stone Size	Percent Passing
15 inches;	100
8 inches;	80-95
6 inches;	45-80
4 inches;	15-45
2 inches;	0-15

SIXTY-FIVE: The revetment shall not contain any reinforcing steel, floatable, or objectionable material. Asphalt or other petroleum-based products may not be used as fill or erosion protection on the levee section or within the floodway.

SIXTY-SIX: The project site including the levee section and access ramps shall be restored to at least the condition that existed prior to commencement of work.

SIXTY-SEVEN: All debris generated by this project shall be disposed of outside the floodway and off the levee section.

SIXTY-EIGHT: The permittee shall replant or reseed the levee slopes to restore sod, grass, or other non-woody ground covers if damaged during project work.

SIXTY-NINE: In the event existing revetment on the channel bank or levee slope is disturbed or displaced, it shall be restored to its original condition upon completion of the proposed installation.

SEVENTY: In the event that levee or bank erosion injurious to the adopted plan of flood control occurs at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Central Valley Flood Protection Board, to prevent further erosion.

SEVENTY-ONE: Debris that may accumulate on the permitted encroachment(s) and related facilities shall be cleared off and disposed of outside the floodway after each period of high water.

SEVENTY-TWO: Any additional encroachment(s) in the floodway, on or in the levee section and within fifty (50) feet of the landward levee toe require an approved permit from the Central Valley Flood Protection Board.

SEVENTY-THREE: By acceptance of this permit, the permittee (Sacramento Area Flood Control Agency) acknowledges the authority of the Central Valley Flood Protection Board to regulate all future encroachments along this levee reach including those that may encroach upon alterations approved by this permit prior to incorporation into the federal Sacramento River Flood Control Project by the Corps of Engineers.

SEVENTY-FOUR: If the permittee or successor does not comply with the conditions of the permit and an enforcement by the Central Valley Flood Protection Board is required, the permittee or successor shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees.

SEVENTY-FIVE: The permittee acknowledges that some portions of the levee may be overbuilt to account for settlement and that upon adoption of the updated Central Valley Flood Management Plan the permittee shall perform a levee crown profile survey of all levee crown covered by this permit and said profile shall be compared to the levee crown profile adopted in the updated Central Valley Flood Management Plan. The permittee shall ensure that the levee crown does not exceed the updated Central Valley Flood Management Plan profile.

RD1000

Exhibit A

RECLAMATION
DISTRICT 1000

Permit Conditions

Permit Application No. 18159-3
Location: Sacramento River (East Levee) Reach 1 to 4B (Natomas Cross Canal to approx RM 74.8)
Applicant: Sacramento Area Flood Control Agency
Description: Construct Adjacent Raised Levee, Construct Landside Berm

CONDITIONS:

1. Maintenance of all encroaching structures, facilities, vegetation or any other items or matters approved under this permit shall remain the responsibility of the Permittee unless otherwise agreed to by the District.

2. Permittee shall obtain all necessary permits and regulatory approvals for the proposed work.

3. Permittee shall coordinate with the District in the preparation of the project plans and specifications and with any modifications thereto. District shall review and approve final plans and specifications prior to advertising for bids and shall also review and approve all proposed modifications to the approved project plans and specifications prior to construction.

4. Work on the levee or within the Sacramento River shall be done outside of the flood season (November 1 to April 15) unless otherwise approved by the Central Valley Flood Protection Board and the District.

5. Permittee shall acquire necessary right of way for the improvements and convey said rights to the District for operation and maintenance to the satisfaction of the District.

1633 GARDEN HIGHWAY
SACRAMENTO, CA 95833
916-922-1449

Exhibit B

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

FEB 29 2008

Flood Protection and Navigation Section (18159-3)

Mr. Jay Punia, Executive Officer
Central Valley Flood Protection Board
State of California
3310 El Camino Ave. Rm. LL40
Sacramento, California 95821

Dear Mr. Punia:

We have reviewed an application for a permit by Sacramento Area Flood Control Agency (Reclamation Board Number 18159-3). The project includes constructing a setback levee by placing approximately 21,400 linear feet of fill and installing a seepage cutoff wall in the left bank levee of the Sacramento River. The project is located in Sacramento, between the Natomas Cross Canal and Elverta Road on the Garden Highway in Sections 1, 12, and 13, Township 10 North, Range 3 East, M.D.B.&M. Survey, Sacramento County, California.

The District Engineer has no objection to a conditional approval of this application by your Board from a flood control standpoint subject to the following conditions:

a. That the permit shall be subject to HQ USACE issuing Section 408 approval. No construction shall be allowed until Section 408 approval is obtained. If HQ USACE disapproves the Section 408 request, the Reclamation Board shall notify the applicant that the conditional permit is no longer valid.

b. That no stockpiles of material or equipment shall remain in the floodway during the flood season of November 1 to April 15.

c. That the applicant shall use imported fill material for the setback levee.

d. That in the event trees and brush are cleared, they shall be properly disposed of either by complete burning or complete removal outside the limits of the project works.

A Section 10 and/or Section 404 permit application (2007-211) is in process for this work.

If you have any questions concerning our comments on this permit application, please contact Ms. Meegan Nagy at (916) 557-7257 or Mr. Robert Murakami at (916) 557-6738.

Sincerely,

Michael D. Mahoney P.E.
Chief, Construction-Operations Division

CF:
Mr. Jeremy Arrich, Chief, Flood Project Integrity and Inspection Branch,
3310 El Camino Avenue, Suite LL30, Sacramento, CA 95821

Attachment 2

Natomas Levee Improvement Program History

Natomas Levee Improvement Program History

Note: This attachment is based on documentation provided by SAFCA. In addition to review by Board direct staff all sections through *"General Re-evaluation of the Common Features Project"* were independently verified for factual accuracy by Project Development Branch staff in DWR's Division of Flood Management.

Overview

The Natomas Levee Improvement Program (NLIP) was initiated by SAFCA to provide a 100-year level of flood protection to the Natomas Basin as quickly as possible and to lay the groundwork for achieving a 200-year level of flood protection over time. This will require improvements to the perimeter levee system around the Natomas Basin, including the Natomas Cross Canal south levee, the Sacramento River east levee, and the Pleasant Grove Creek Canal west levee. The NLIP will likely also require improvements to the NEMDC west levee and the American River north levee.

The NLIP is part of a larger program of improvements to the flood control system protecting the Sacramento Area that was initiated by the USACE, the Board and SAFCA as part of the American River Watershed Investigation (ARWI) following the record flood of 1986. Key events and actions that have shaped the ARWI are outlined below so as to provide the historical and legislative context within which the NLIP is being pursued.

1986 Flood

The record flood of 1986 caused levee failures in many areas of the Sacramento Valley that resulted in millions of dollars of property damage and exposed numerous deficiencies in the Sacramento River Flood Control Project (SRFCP). In the Sacramento area, these deficiencies included: (1) unstable levees along the east bank of the Sacramento River that were susceptible to failure due to the porous nature of the material used in their construction, (2) inadequate conveyance capacity in the drainage channels around the Natomas Basin that serve to divert runoff from the foothills into the Sacramento and American Rivers, and (3) inadequate reservoir storage capacity for controlling large floods in the American River watershed.

Sacramento Urban Levee Reconstruction Project

The initial step in addressing the identified deficiencies was to implement the Sacramento Urban Levee Reconstruction Project to stabilize the levees along the east bank of the Sacramento River upstream and downstream of the American River. The stabilization effort employed two measures to address this seepage problem. Where space permitted, as in much of the upper Natomas Basin, a drained stability berm was constructed along the landside toe of the levee to intercept any water seeping through the levee and discharge it into a drainage ditch to be pumped back into the river.

Where space was limited, as in the Pocket area and the lower Natomas Basin, a slurry cutoff wall was excavated through the levee and into less permeable ground below. This cutoff wall serves as a barrier to seepage through the permeable levee embankment soils. Construction of these improvements, covering approximately 33 miles of the Sacramento River east levee, was initiated in 1990 and completed in 1993.

American River Watershed Investigation

In addition to levee stabilization, USACE, State, and SAFCA used the ARWI to develop a broad program of improvements to Sacramento's flood control focusing on construction of a flood detention dam along the American River near Auburn combined with raising and strengthening the levees along the tributary streams and drainage canals around the Natomas Basin. The ARWI Selected Plan, which was designed to provide at least a 200-year level of flood protection to the Sacramento area, was presented to Congress in 1992. However, in the face of opposition to the detention dam, Congress authorized (as part of the Water Resources Development Act of 1996) only the levee improvements around the Natomas Basin and directed that these improvements should proceed while the USACE re-evaluated options for controlling floods along the remainder of the Lower American River. The legislation left open the possibility that the authorized improvements could be constructed by non-Federal interests in exchange for future credits or reimbursements.

North Area Local Project

Relying on the Natomas authorization, SAFCA initiated the North Area Local Project (NALP). This locally funded project was designed to provide a high level of flood protection to the Natomas Basin in a manner that neither depended on nor prejudiced the outcome of the continuing effort to develop a comprehensive plan for protecting the floodplains along the Lower American and Sacramento Rivers outside the Natomas Basin. Toward this end, SAFCA designed the levees along the lower reaches of the Natomas East Main Drainage Canal/Steelhead Creek (NEMDC), Arcade Creek, and Dry/Robla Creek to contain the maximum water surface elevation that could be anticipated in the lower American River at the mouth of the NEMDC during a 200-year or greater flood event under any of the alternatives under consideration, including no action. The NALP, which also included levee strengthening measures along the Natomas Cross Canal south levee and the PGCC west levee, was substantially completed in 1996.

American River Common Features Project

In 1996, the USACE transmitted a Supplemental Information Report (SIR) to Congress that presented the results of the requested re-evaluation of flood risk reduction options for the American River watershed. The SIR concluded that regardless of what measures might be implemented to increase the reservoir storage space available for flood control along the American River; the levees extending upstream from the mouth of the river should be strengthened to resist seepage. Moreover, the

SIR indicated that SAFCA's levee improvements around the Natomas Basin were sufficient to protect the basin from at least a 200-year flood along the American River and with modifications to the upper 12 miles of the east levee of the Sacramento River, including increased freeboard and levee stability improvements, a similarly high level of protection could be secured along the Sacramento River.

These American River and Natomas Basin improvements were considered "common features" of any long-term effort to provide Sacramento with a high level of flood protection, and Congress directed the Secretary of the Army to design and construct them under the auspices of the Common Features Project. On the basis of this Congressional action, the State Legislature also authorized the Common Features Project. SAFCA has incorporated these features into the NLIP.

1997 Flood

Shortly after the conclusion of the 1996 federal legislative session the Sacramento Valley was again was hit by record flooding. The flood of 1997 produced flows in the Lower Sacramento and American Rivers comparable to those of the flood of 1986. The levees around the Natomas Basin and along the Lower American and Sacramento Rivers, improved as a result of the Sacramento Urban Levee Reconstruction Project and the NALP and relieved by credits for the additional flood storage capacity available alpine reservoirs (Union Valley, French Meadows, Hell Hole) upstream of Folsom Reservoir as part of the post-1986 Folsom Reoperation Project, passed these flows without the signs of stress that occurred in 1986. On the other hand, the flood did cause failures of some SRFCP levees along the Feather River and Sutter Bypass upstream of the Natomas Basin. The USACE post-flood assessment concluded that underseepage may have contributed to these levee failures. To address this risk, the USACE recommended a broader scope for the Common Features Project, including deeper seepage cutoff walls through the levees along the Lower American River.

Expansion of the Common Features Project

In 1999 Congress approved (as part of the Water Resources Development Act of 1999) a plan for increasing flood protection along the American River by modifying Folsom Dam's outlet works to make the dam's flood control operation more efficient. Congress also expanded the scope of the Common Features Project, calling for the levees along the lower American River to be raised and strengthened to ensure safe containment of flows in the river up to 160,000 cubic feet per second (cfs) with at least 3 feet of freeboard, and directed the USACE to raise the NCC south levee to provide 200-year or greater flood protection. On the basis of this Congressional action, the State Legislature also authorized the modifications to Folsom Dam and the expansion of the Common Features Project including raising and strengthening the NCC south levee. SAFCA has also incorporated these features into the NLIP.

General Re-evaluation of the Common Features Project

By 2000 serious concerns about underseepage caused the USACE to re-evaluate the scope of the authorized Common Features Project improvements for the Natomas Basin. In order to guide this re-evaluation the USACE convened a blue-ribbon panel to assess the risk of underseepage and develop new standards for urban levee certification. These new standards were adopted by the USACE in August 2004. SAFCA used them to launch a comprehensive reassessment of the Natomas levee system in 2005. The Hurricane Katrina-induced flooding of New Orleans occurred in the midst of this effort, creating widespread public interest in the outcome.

As set forth in the Natomas Levee Evaluation Study Final Report (July 14, 2006) SAFCA's reassessment concluded that many segments of the Natomas levee system are vulnerable to underseepage in the event of a severe flood, and that many levee segments in the system are not high enough to meet applicable federal and anticipated state freeboard requirements (typically three feet). SAFCA proposes to address these deficiencies with measures similar to those currently being implemented along the Lower American River, including raising levees in place and installing cutoff walls through the affected levee segments.

Legislative Authorization of NLIP by Assembly Bill 1147, September 2000

As stated by SAFCA the NLIP project was adopted and authorized by the Legislature under AB 1147 (Chapter 1071, September 2000) in the following section (bill text italicized):

SEC. 12. Section 12670.14 is added to the Water Code, to read:

12670.14. The following projects in areas within the City of Sacramento and the Counties of Sacramento and Sutter are adopted and authorized at an estimated cost to the state of the sum that may be appropriated by the Legislature for state participation upon the recommendation and advice of the department or the Reclamation Board:

(a) The project for flood control in the Natomas and North Sacramento areas adopted and authorized by Congress in Section 9159 of the Department of Defense Appropriations Act of 1993 (P.L. 102-396) substantially in accordance with the recommendations of the Chief of Engineers in the report entitled ''American River Watershed Investigation'' dated July 1, 1992.

(b) The project for flood control along the American and Sacramento Rivers adopted and authorized by Congress in Section 101(a)(1) of the Water Resources Development Act of 1996 substantially in accordance with the recommendations of the Chief of Engineers in the report entitled ''American River Watershed Project, California'' dated June 27, 1996, as modified by Congress in Section 366 of the Water Resources Development Act of 1999.

The Board retains final approval authority to adopt and authorize the NLIP project components under its CCR Title 23 regulations, as confirmed by underlined 1147 language in the bill excerpt above.

Attachment 3

33 USC Section 408 Request Letter
Approved January 2008

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. LL40
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0653 FAX: (916) 574-0682

February 4, 2008

Colonel Thomas C. Chapman, District Engineer
U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814

Dear Colonel Chapman:

The California Central Valley Flood Protection Board (Board) is requesting approval by the U.S. Army Corps of Engineers (Corps) under 33 U.S.C. 408, on behalf of the Sacramento Area Flood Control Agency (SAFCA), to alter a portion of the Sacramento River Flood Control Project. The Board has determined that the proposed alteration is in the best interest of the public and will not have a detrimental effect on the Sacramento River Flood Control Project. Additional documentation provided by SAFCA is attached to describe the proposed alteration.

If the Corps approves the proposed alteration, the Board will proceed with its permitting process. If a permit is granted, the project has been completed, and the alteration has been formally incorporated within the federal project by the Corps, the State of California, acting through the Board, will accept the altered project for operation and maintenance and hold and save the United States free from damage due to the construction works.

Within 90 days of completion of the project alteration, the Board will provide information to the Corps for the purposes of preparing a revised Operation and Maintenance Manual for this portion of the Sacramento River Flood Control Project, along with as-built Plans and Specifications for the alteration.

SAFCA proposes to begin construction during summer 2008 and to complete work prior to the 2009-2010 flood season. To facilitate this schedule, the Board requests that Corps' review be completed no later than May 1, 2008.

If you have any questions or need further information, please contact me at (916) 574-0609.

Sincerely,

/s/
Benjamin F. Carter, President
Central Valley Flood Protection Board

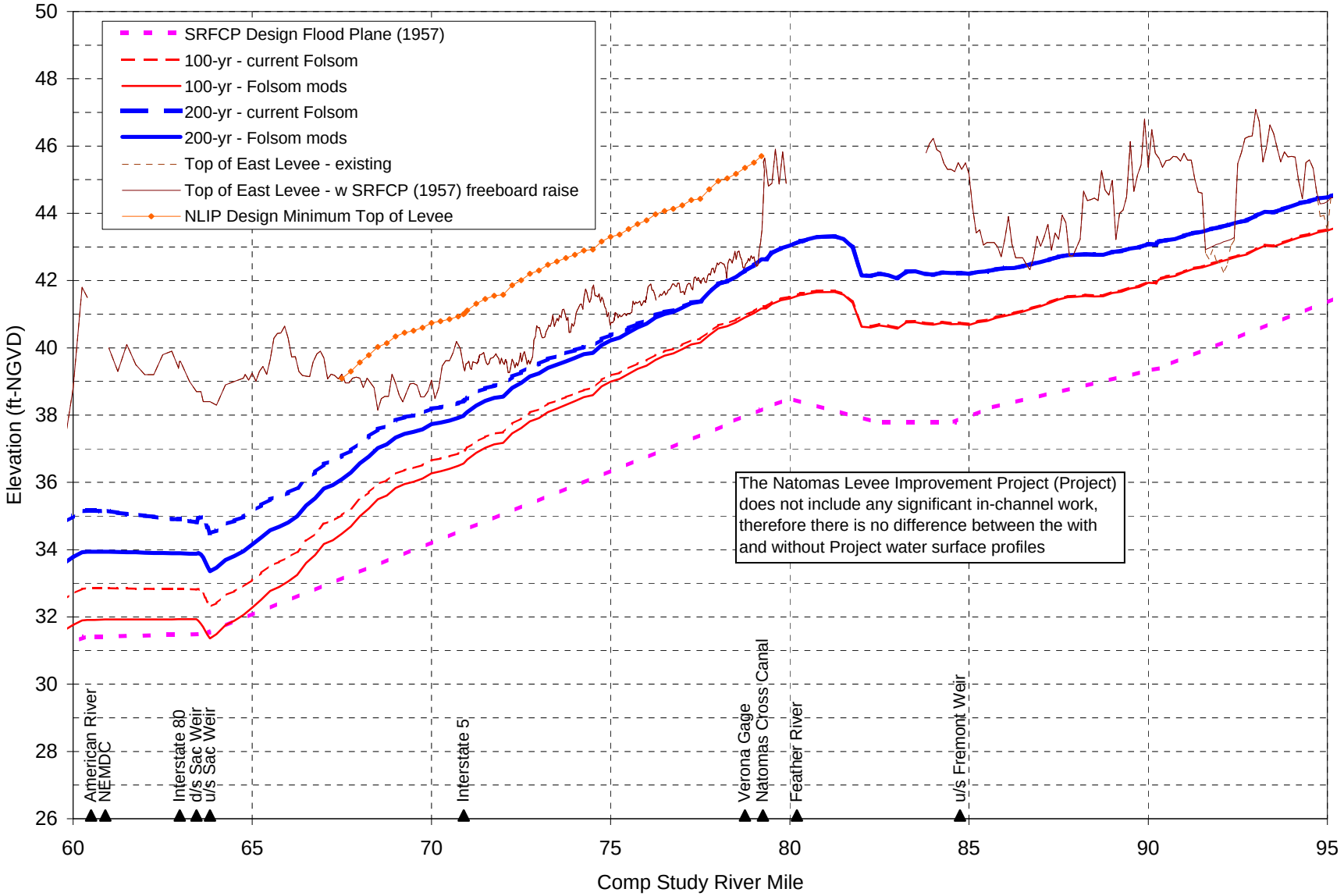
/s/
Maureen "Lady Bug" Doherty, Secretary
Central Valley Flood Protection Board

cc: Mr. John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, California 95814-3407

Attachment 4

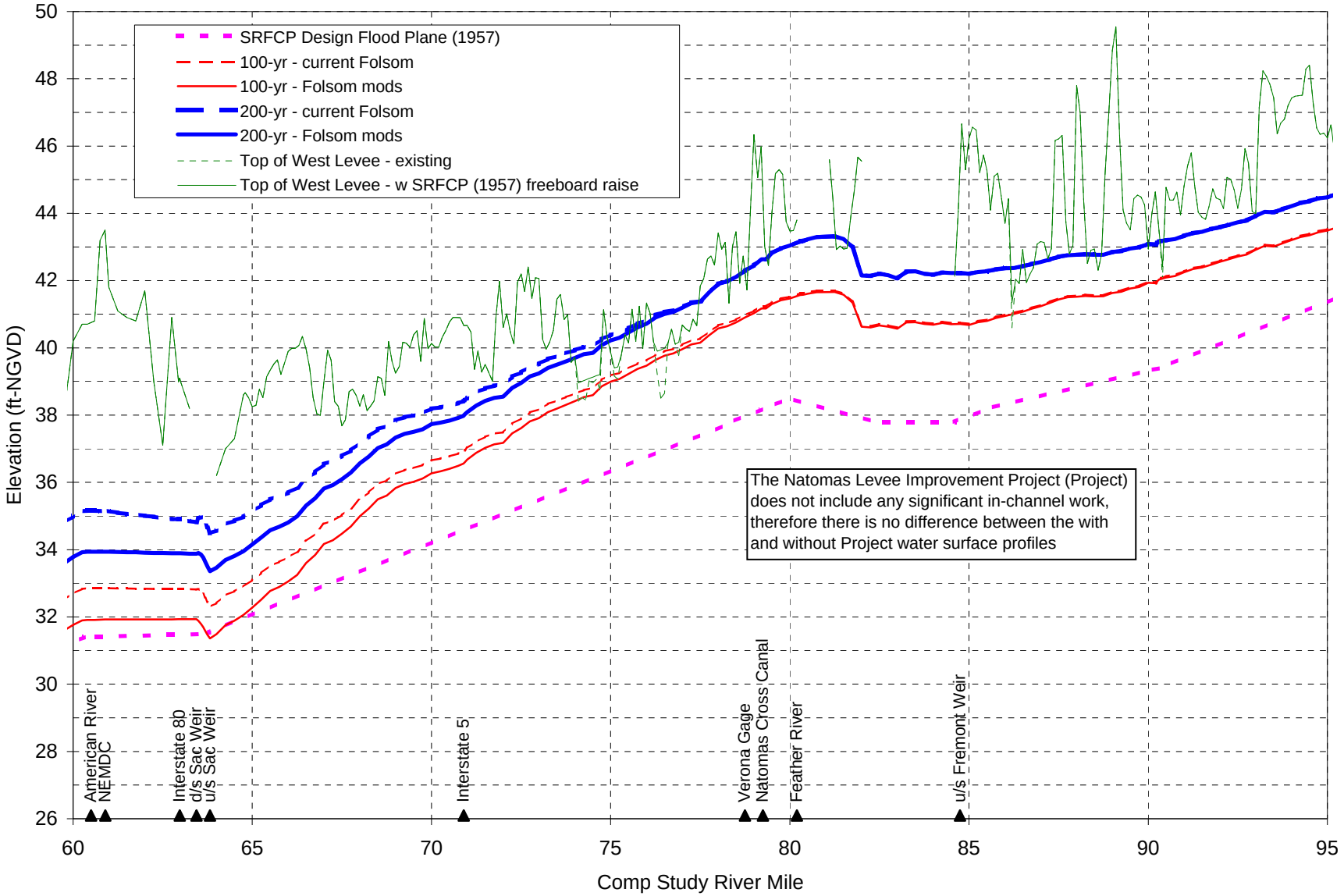
Water Surface Profiles from Hydraulic Analysis
January 2008

Water Surface and East (Left) Levee Profiles
Sacramento River - Mile 95 to American River



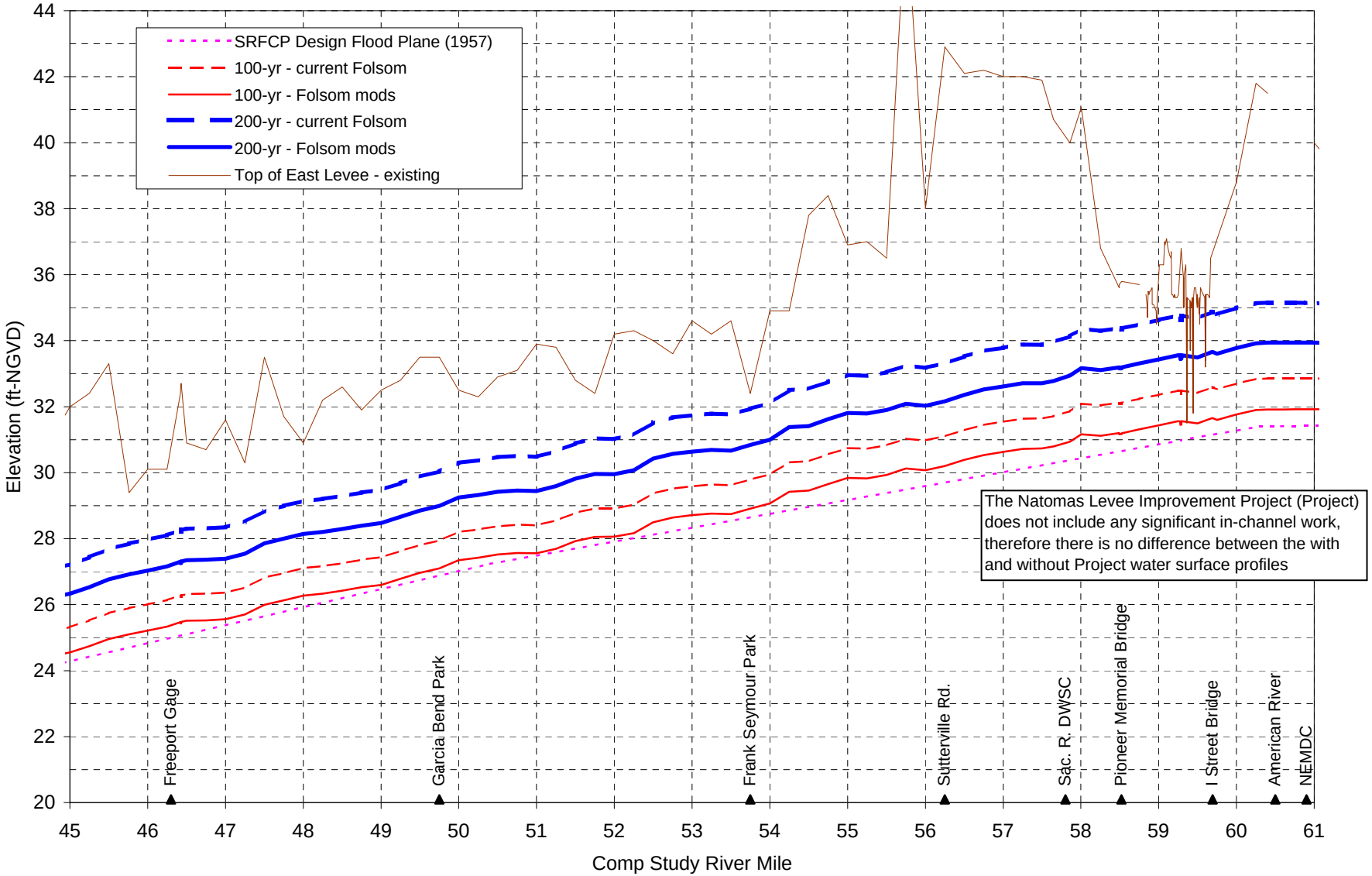
MBK Engineers 1/7/08
profiles_Butler-request_2008-01-07.xls [Sac R us AR LB]

Water Surface and West (Right) Levee Profiles
Sacramento River - Mile 95 to American River



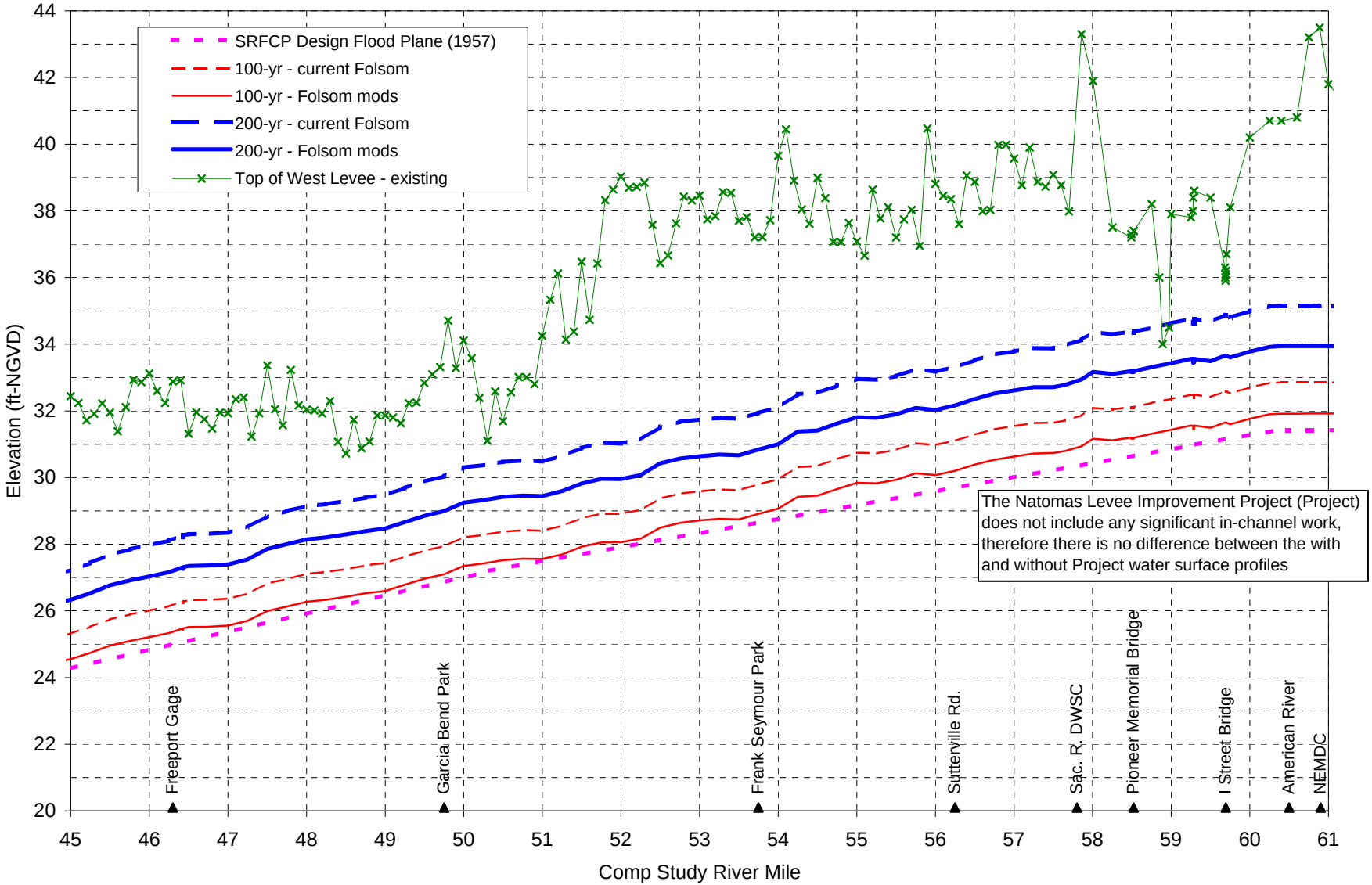
MBK Engineers 1/7/08
profiles_Butler-request_2008-01-07.xls [Sac R us AR RB]

Water Surface and East (Left) Levee Profiles
Sacramento River - American River to Freeport



MBK Engineers 1/7/08
profiles_Butler-request_2008-01-07.xls [Sac R ds AR LB]

Water Surface and West (Right) Levee Profiles
Sacramento River - American River to Freeport



MBK Engineers 1/7/08
profiles_Butler-request_2008-01-07.xls [Sac R ds AR RB]

Attachment 5

Senate Bill 276
October 2007

Senate Bill No. 276

CHAPTER 641

An act to amend Sections 12670.14 and 12670.16 of the Water Code, relating to water.

[Approved by Governor October 13, 2007. Filed with Secretary of State October 13, 2007.]

LEGISLATIVE COUNSEL'S DIGEST

SB 276, Steinberg. Flood control projects.

Existing law adopts and authorizes, at an estimated cost to the state of the sum that may be appropriated by the Legislature for state participation upon the recommendation and advice of the Department of Water Resources or the Reclamation Board, the federally authorized project for flood control along the American and Sacramento Rivers, as modified, and the Folsom Dam modification project, as modified by a prescribed report prepared by the Sacramento Area Flood Control Agency.

This bill would, for the purposes of those authorizations, describe the project for flood control along the American and Sacramento Rivers as further modified to include a specified 200-year level of flood protection. The bill would describe the Folsom Dam modification project as further modified by a specified report adopted by Congress. The bill would specify the extent of state and local participation in specified flood control projects administered by the Sacramento Area Flood Control Agency.

The people of the State of California do enact as follows:

SECTION 1. The Legislature hereby finds and declares all of the following:

(a) Sacramento was founded over 150 years ago in a flood plain at the confluence of the Sacramento and American Rivers. Commercially dependent on river transport, the city suffered from flood disasters because of inadequate flood protection. Construction of the present day levee system and Folsom Dam have spared modern Sacramento from catastrophic flooding. However, the record floods of 1986 and 1997 exposed significant deficiencies in this flood control system, making the state capital region the most at-risk urban area in the country.

(b) Since 1986, the State of California has participated in a cost-sharing partnership with the federal government and the Sacramento Area Flood Control Agency that has produced substantial investments in improved flood protection for the people and property occupying the historic flood plain,

including the State Capitol and more than 1,300 other government-owned buildings and infrastructure.

(c) Although the state capital region is now better protected than at any time in its history, intensive development of the flood plain has significantly increased the potential consequences of an uncontrolled flood and heightened the state's interest in continuing to invest in a defined cost-shared program to provide the region with an adequate level of flood protection. Without state funding, federal and local flood control investments will not be secured, the risk of flooding will remain unacceptably high, and the region's economic development and environmental health will be imperiled.

(d) The Congress and the President of the United States have recognized the national importance of improving the state capital's flood protection system by authorizing projects in the Defense Appropriations Act of 1993, the Water Resources Development Act of 1996, the Water Resources Development Act of 1999, and the Energy and Water Development Appropriations Act of 2004.

(e) In 2000, in response to the Legislature's expressed desire to develop a long-term policy to guide the state's participation in future flood management projects, Assembly Bill 1147 was passed by the Legislature, signed by Governor Gray Davis, and enacted as Chapter 1071 of the Statutes of 2000.

(f) The legislation added Section 12670.14 to the Water Code. This section authorized flood control projects for the protection of specific areas within the Sacramento region against a catastrophic flood event, including the project for flood control along the American and Sacramento Rivers, the project for flood control in the Natomas and North Sacramento area, and the project to modify Folsom Dam.

(g) The legislation also added Section 12585.7 to the Water Code. Section 12585.7 changed the formula for the sharing of the nonfederal capital costs of all projects authorized by the Legislature on or after January 1, 2002, two years after the effective date of the legislation.

(h) The project for flood control along the American and Sacramento Rivers, including improvements to the Natomas levees, and the project to modify Folsom Dam were authorized by both the state and federal governments prior to January 1, 2002. Subsequently, in order to address changing engineering standards and conditions, the United States Army Corps of Engineers recommended, and Congress approved, postauthorization changes to these projects.

(i) In April 2007, the Sacramento Area Flood Control Agency secured the support of property owners in the Sacramento region for the imposition of a special benefit assessment to fund the local share of the cost of the levee improvement projects along the American and Sacramento Rivers, including the Natomas area, and the project to modify Folsom Dam to provide the Sacramento region with at least a 200-year level of flood protection based on current estimates of the runoff likely to be produced by such a flood event.

(j) This act modifies existing state authorizations for these projects to ensure that the historic federal-state-local cost-sharing partnership which has sustained these projects is continued and project construction moves forward as quickly as possible. The constructed projects will increase the ability of the existing flood control system to protect heavily urbanized areas within the City of Sacramento and the Counties of Sacramento and Sutter against very rare floods.

(k) As evidenced by the environmental impact reports certified in connection with these projects, including the hydrology and hydraulics impact analysis set forth in the environmental impact report prepared by the Sacramento Area Flood Control Agency with regard to local funding mechanisms for comprehensive flood control improvements for the Sacramento area dated February 2007, the increase in flood protection associated with improving the American and Sacramento River levees and modifying Folsom Dam will be accomplished without altering or otherwise impairing the design flows and water surface elevations prescribed as part of the Sacramento River Flood Control Project. Accordingly, these improvements will not result in significant adverse hydraulic impacts to the lands protected by the Sacramento River Flood Control Project. Thus, it is not necessary or appropriate to require these projects to include hydraulic mitigation.

(*l*) The projects authorized in Section 12670.14 of the Water Code will increase the ability of the existing flood control system in the lower Sacramento Valley to protect heavily urbanized areas within the City of Sacramento and the Counties of Sacramento and Sutter against very rare floods without altering the design flows and water surface elevations prescribed as part of the Sacramento River Flood Control Project or impairing the capacity of other segments of the Sacramento River Flood Control Project to contain these design flows and to maintain water surface elevations. Accordingly, the projects authorized in that section will not result in significant adverse hydraulic impacts to the lands protected by the Sacramento River Flood Control Project and neither the Reclamation Board nor any other state agency shall require the authorized projects to include hydraulic mitigation for these protected lands.

SEC. 2. Section 12670.14 of the Water Code is amended to read:

12670.14. The following projects in areas within the City of Sacramento and the Counties of Sacramento and Sutter are adopted and authorized at an estimated cost to the state of the sum that may be appropriated by the Legislature for state participation upon the recommendation and advice of the department or the Reclamation Board:

(a) The project for flood control in the Natomas and North Sacramento areas adopted and authorized by Congress in Section 9159 of the Department of Defense Appropriations Act of 1993 (Public Law 102-396) substantially in accordance with the recommendations of the Chief of Engineers in the report entitled “American River Watershed Investigation” dated July 1, 1992.

(b) The project for flood control along the American and Sacramento Rivers adopted and authorized by Congress in Section 101(a)(1) of the Water Resources Development Act of 1996 substantially in accordance with the recommendations of the Chief of Engineers in the report entitled "American River Watershed Project, California" dated June 27, 1996, as modified by Congress in Section 366 of the Water Resources Development Act of 1999, and as further modified to include the project features necessary to provide a 200-year level of flood protection along the American and Sacramento Rivers and within the Natomas Basin as described in the final engineer's report dated April 19, 2007, adopted by the Sacramento Area Flood Control Agency.

(c) The project to modify Folsom Dam adopted and authorized by Congress in Section 101(a)(6) of the Water Resources Development Act of 1999, as described in the United States Army Corps of Engineers Supplemental Information Report for the American River Watershed Project, California, dated March 1996, as modified by the report entitled "Folsom Dam Modification Report, New Outlets Plan," dated March 1998, prepared by the Sacramento Area Flood Control Agency, and as further modified by the Post-Authorization Change Report, American River Watershed Project (Folsom Dam Modification and Folsom Dam Raise Projects), dated March 2007, adopted by Congress in Section 3023 of the Water Resources Development Act of 2007.

(d) (1) The project for flood control, environmental restoration, and recreation along south Sacramento County streams adopted and authorized by Congress in Section 101(a)(7) of the Water Resources Development Act of 1999 as described in the report of the Chief of Engineers entitled "South Sacramento County Streams, California" dated October 6, 1998.

(2) Notwithstanding Section 12657, at the discretion of the Reclamation Board, the Sacramento Area Flood Control Agency may provide, for the project described in paragraph (1), the assurances of local cooperation satisfactory to the Secretary of the Army, in accordance with Section 12657, in lieu of assurances by the Reclamation Board.

SEC. 3. Section 12670.16 of the Water Code is amended to read:

12670.16. (a) Notwithstanding any other provision of law, the Sacramento Area Flood Control Agency's share of the nonfederal capital costs of the projects for flood control authorized in Section 12670.14 shall be calculated in accordance with Section 12585.5, and the agency shall be reimbursed pursuant to Section 12585.5 for any costs of project features that the agency advances on behalf of the department or Reclamation Board if either of the following requirements is met:

(1) The advances are made in response to a federal request for payment of the nonfederal share of the cost of the project.

(2) If the advances are made for project features that have not yet been authorized by Congress, the Reclamation Board has received a written determination by the federal government that the project features will likely be authorized by Congress and, if so authorized, the advances will be eligible for credit toward the nonfederal share of the cost of these features.

(b) Prior to any reimbursement pursuant to subdivision (a), the agency shall execute an agreement with the department under which it agrees to indemnify and hold the state harmless from damages due to the construction, operation, or maintenance of those projects and agrees to operate, maintain, repair, replace, and rehabilitate those projects, or provide the agreement of its appropriate member agency to do so.

O

Attachment 6

Board Resolution 2008-04

STATE OF CALIFORNIA
THE RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD

RESOLUTION NO. 2008-04

FINDINGS AND DECISION AUTHORIZING ISSUANCE OF
ENCROACHMENT PERMIT NO. 18159-3
SACRAMENTO RIVER EAST LEVEE PHASE I IMPROVEMENT PROJECT
REACHES 1 THROUGH 4B
SACRAMENTO AREA FLOOD CONTROL AGENCY
SACRAMENTO AND SUTTER COUNTIES

WHEREAS, the Sacramento Area Flood Control Agency ("SAFCA") has begun a multi-year Natomas Levee Improvement Program; and

WHEREAS, SAFCA as lead agency under the California Environmental Quality Act, Public Resources Code sections 21000 *et seq*. ("CEQA") prepared an Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project ("EIR") (incorporated herein by reference and available at the Central Valley Flood Protection Board offices or SAFCA offices); and

WHEREAS, SAFCA, as lead agency, certified the EIR, adopted mitigation measures and a Mitigation Monitoring Reporting Plan ("MMRP") (incorporated herein by reference and available at the Central Valley Flood Protection Board or at SAFCA), approved findings and a statement of overriding considerations pursuant to CEQA and the CEQA Guidelines (incorporated herein by reference); and approved the Project as identified in Alternative 1of the EIR; and

WHEREAS, SAFCA submitted Application No. 18159-3 to the Reclamation Board on November 7, 2007. The application proposes to place landside fill to raise and widen approximately 22,800 feet of the existing east project levee (left bank looking downstream) of the Sacramento River, and to install seepage remediation measures including seepage berms, relief wells and surface drains.

WHEREAS, On January 1, 2008, the new Central Valley Flood Protection Board came into being, and succeeded to all of the responsibilities of the former Reclamation Board; and

WHEREAS, on January 18, 2008, the Central Valley Flood Protection Board heard presentations by its staff, SAFCA, and interested persons and the public regarding the proposed application, and approved sending a letter to the U.S. Army Corps of Engineers ("USACE") requesting permission to modify a federal levee; and

WHEREAS, the Central Valley Flood Protection Board has conducted a hearing and has reviewed the application, the Reports of its staff, the documents and correspondence in its file, and the environmental documents prepared by SAFCA;

NOW, THEREFORE, BE IT RESOLVED THAT,

Findings of Fact.

1. The Central Valley Flood Protection Board hereby adopts as findings the facts set forth in the Staff Report under the headings "Location", "Existing Flood Control and Irrigation Facilities", "Prior History", "Description of Proposed Project Improvements", "Construction Drawings and Specifications", "Local Agency Endorsement", "DWR FloodSAFE California Early Implementation Program", "U.S. Army Corps of Engineers Comments", "Hydraulic Analysis and Impacts", and "CEQA Compliance."

2. The Board has reviewed the Figures, Attachments, and References listed on page 13 of the Staff Report.

CEQA Findings.

3. The Central Valley Flood Protection Board, as a responsible agency, has independently reviewed the analysis in the EIR, MMRP, and the findings prepared by the lead agency, SAFCA, and has reached its own conclusions regarding them.

4. The Central Valley Flood Protection Board, after consideration of the EIR, MMRP and SAFCA findings, adopts the project description, analysis and findings in the EIR, MMRP and SAFCA Findings which are relevant to activities authorized by issuance of a final encroachment permit consistent with Draft Permit No. 18159-3, the Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4B. The Board recognizes that the SAFCA documents are presently being challenged in litigation. However, CEQA Guideline Section 15231 provides: "A final EIR prepared by a lead agency . . . shall be conclusively presumed to comply with CEQA for purposes of use by responsible agencies which were consulted . . . unless one of the following conditions occurs: (a) The EIR or negative declaration is finally adjudged in a legal proceeding not to comply with the requirements of CEQA, or (b) A subsequent EIR is made necessary by Section 15162 of these guidelines." The Board finds and concludes that the circumstances requiring a subsequent EIR are not present.

5. The EIR concluded that Impact 3.4-a, Hydraulic Effects of the Proposed Levee Improvements, would be less than significant and that mitigation is not required. Based on the "Hydraulic Analysis and Impacts" section of the Staff Report, the Board concurs that all impacts are not significant.

6. **Findings regarding significant impacts**. Pursuant to CEQA Guidelines sections 15096(h) and 15091, the Central Valley Flood Protection Board determines that the SAFCA Findings, attached to the Staff Report as Reference 3, and incorporated herein by reference, summarize the EIR's determinations regarding Project impacts before and after mitigation. Having reviewed the EIR and the SAFCA Findings, the Central Valley Flood Protection Board makes its findings as follows:

a. The Central Valley Flood Protection Board finds that the project may have the following significant, unavoidable impacts, as more fully described in the EIR and the SAFCA Findings (SAFCA EIR Impact # referenced in parenthesis):

A. Conversion of Important Farmland to Nonagricultural Uses (3.2-b)
B. Potential Construction Impacts on Known Prehistoric Resources (3.8-a)
C. Damage to or Destruction of Previously Undiscovered Cultural Resources (3.8-d)
D. Discovery of Human Remains during Construction (3.8-e)
E. Temporary Increase in Traffic on Local Roadways during Construction (3-10a)
F. Temporary Emissions of ROG, NO_x and PM_{10} during Construction (3.11-a)
G. Generation of Short-Term Construction Noise (3.12-a)
H. Exposure of Sensitive Receptors to or Generation of Excessive Groundborne Vibration or Noise (3.12-b)
I. Exposure of Residents to Increased Traffic Noise Levels from Hauling Activity (3.12-c)
J. Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character of the Project Area (3.14-a)
K. Cumulative Impact, Agricultural Resources
L. Cumulative Impact, Cultural Resources
M. Cumulative Impact, Air Quality
N. Cumulative Impact, Noise
O. Cumulative Impact, Visual Resources

The Board finds that changes or alterations have been required in, or incorporated into, the project which substantially lessen such impacts, as set forth more fully in the SAFCA Findings, but that each of the above impacts remains significant after mitigation. Such mitigation measures are within the responsibility of another agency, SAFCA, and SAFCA can and should implement the described mitigation measures. Specific economic, legal, social, technological or other considerations, rendered infeasible mitigation or alternatives that would have reduced these impacts to less than significant.

b. The Central Valley Flood Protection Board finds that the project may have the following significant impacts:

A. Potential Temporary, Short-term Construction-Related Erosion (3.3-a)
B. Alteration of Local Drainage (3.4-b)
C. Effects on Water Quality from Groundwater Discharged by Relief Wells (3.5-b)
D. Loss of Fish Habitat Through Increased Sedimentation and Turbidity or Releases of Contaminants (3.6-a)
E. Loss of Shaded Riverine Aquatic Habitat Associated with Levee Improvement Activities (3.6-b)
F. Loss of Sensitive Habitats (3.7-a)

G. Disturbance and Loss of Special-Status Plant Habitat (3.7-b)
H. Loss of Potential Habitat for Valley Elderberry Longhorn Beetles (3.7-c)
I. Disturbance and Loss of Giant Garter Snake Habitat (3.7-d)
J. Disturbance and Loss of Northwestern Pond Turtle Habitat (3.7-e)
K. Loss of Swainson's Hawk Habitat and Potential Disturbance of Nests (3.7-f)
L. Loss and Potential Disturbance of Habitat for Other Special-Status Birds (3.7-g)
M. Loss and/or Disturbance of Wildlife Corridors (3.7-h)
N. Consistency with the Natomas Basin Habitat Conservation Plan (3.7-i)
O. Changes to Elements of Reclamation District 1000 (3.8-a)
P. Disturbance of Unknown Unique Paleontological Resources during Earthmoving Activities (3.9-a)
Q. Temporary Increase in Traffic Hazards on Local Roadways during Construction (3.10-b)
R. Temporary Effect on Emergency Service Response Times and Access during Construction (3.10-c)
S. Permanent Encroachment on Parkland along Garden Highway (3.13-b)
T. Potential Temporary Disruption of Irrigation Supply (3.15-a)
U. Potential Disruption of Utility Service during Construction (3.15-b)
V. Exposure to Hazardous Materials Encountered at Project Sites (3.16-b)
W. Temporary Aircraft Safety Hazards Resulting from Project Construction Activities within or near the Airport Critical Zone (3.16-c)
X. Potential to Result in Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport (3.16-d)
Y. Interference with an Adopted Emergency Evacuation Plan(3.16-e)
Z. Exposure to Wildland Fires (3.16-f)

The Board finds that changes or alterations have been required in, or incorporated into, the project which substantially lessen such impacts, as set forth more fully in the SAFCA Findings, which describe the mitigation measures for each impact in detail. With such mitigation, each of the significant impacts will be reduced to less-than-significant. Such mitigation measures are within the responsibility of another agency, SAFCA, and SAFCA can and should implement the described mitigation measures.

7. As a responsible agency, the Central Valley Flood Protection Board has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the Project which it decides to carry out, finance, or approve. The Board confirms that it has reviewed the MMRP, and confirmed that SAFCA has adopted and committed to implementation of the measures identified therein. The Board agrees with the analysis in the MMRP and confirms that there are no feasible mitigation measures within its powers that would substantially lessen or avoid any significant effect the project would have on the environment. None of the mitigation measures in the MMRP require implementation by the Board directly, although continued implementation of the MMRP shall be made a condition of issuance of the Encroachment Permit. However, the measures in the MMRP may be modified to accommodate changed circumstances or new information not triggering

the need for subsequent or supplemental analysis under CEQA Guidelines sections 15062 or 15063

8. **Alternatives.** As a responsible agency, the Central Valley Flood Protection Board has responsibility for considering only alternatives which would reduce or avoid impacts of those parts of the Project which it decides to carry out, finance, or approve. The EIR considered four alternatives to the proposed project and SAFCA found them all to be infeasible. The Board concurs with this finding, for the reasons given by SAFCA. The Board finds that there are no feasible alternatives within its powers that would substantially lessen or avoid any significant effect the project would have on the environment.

9. **Statement of Overriding Considerations**. Pursuant to CEQA Guidelines sections 15096(h) and 15093, the Board has balanced the economic, social, technological and other benefits of the Project described in application No. 18159-3, against its significant and unavoidable impacts, listed in paragraph 6 (a) above, and finds that the benefits of the Project outweigh these impacts and they may, therefore, be considered "acceptable".

The Central Valley Flood Protection Board finds that there is an immediate need to protect the people and property at risk in the project area. The Natomas Basin floodplain is occupied by over 83,000 residents and $10 billion in damageable property. The area is presently vulnerable to flooding in a less than 100-year flood event along the Sacramento River or American River. The Natomas Basin is a deep floodplain and depending on the circumstances, flood depths in the Natomas Basin could reach life-threatening levels. The disruption in transportation that would result from a major flood would affect the Sacramento International Airport, interstate and state highways, and rail service.

The health and safety benefits of the project, which would significantly reduce the risk of an uncontrolled flood in the Natomas Basin that would result in a catastrophic loss of property and threat to residents of the area, outweigh the remaining unavoidable environmental impacts.

Findings pursuant to Water Code section 8610.5

10. **Evidence Admitted into the Record**. The Board has considered all the evidence presented in this matter, including the Application, the Staff Report and its attachments, the Natomas Levee Improvement Program Landside Improvements Project EIR (Draft and Final versions), the MMRP, the SAFCA Findings, the Corps of Engineers' Investigation Results on the Natomas Levees, the transcript of the Central Valley Flood Protection Board meeting on January 18, 2008, including the presentation by the U.S. Army Corps of Engineers and the Board hearing on permit application 18159-2, and the presentations made at the Central Valley Flood Protection Board meeting on March 21, 2008, all the letters and other correspondence received by the Board in this matter, and all items in the Board's file on this matter.

The custodian of the file is Executive Officer Jay Punia at the Central Valley Flood Protection Board.

11. **Best Available Science**. In making its findings, the Board has used the best available science relating to the issues presented by all parties. On the important issue of hydraulic impacts and the computed water surface profiles, SAFCA used the UNET one-dimensional unsteady flow model developed by the USACE for the Sacramento-San Joaquin Comprehensive Study. The model is considered by many experts as one of the best available scientific tools for the purpose of modeling river hydraulics, including flood control system simulations and water surface profile computations.

12. **Effects on State Plan of Flood Control**. The Board finds that the direct hydraulic impacts of the proposed Sacramento River East Levee Improvements, as computed using the UNET model, on the entire State Plan of Flood Control, as set forth in the Staff Report on pages 6-9, are not significant. This includes landside levee raises, adjacent setback levees, seepage berms, and drainage collection systems.

In California Statutes of 2007, Chapter 641 (SB276), the Legislature found and declared that "The projects authorized in Section 12670.14 of the Water Code [which includes the Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4B work] will increase the ability of the existing flood control system in the lower Sacramento Valley to protect heavily urbanized areas within the City of Sacramento and the Counties of Sacramento and Sutter against very rare floods without altering the design flows and water surface elevations prescribed as part of the Sacramento River Flood Control Project or impairing the capacity of other segments of the Sacramento River Flood Control Project to contain these design flows and to maintain water surface elevations. Accordingly, the projects authorized in that section will not result in significant adverse hydraulic impacts to the lands protected by the Sacramento River Flood Control Project and neither the Reclamation Board nor any other state agency shall require the authorized projects to include hydraulic mitigation for these protected lands."

13. **Effects of reasonably projected future events**. The impact of climate change on future hydrology and floodplain conditions is discussed in the Draft EIR at pages 3.11-12 to 3.11-13. An increase in precipitation due to climate change "could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events" thus placing more pressure on California's levee/flood control system. The impact of greenhouse gases is acknowledged and discussed in the DEIR in Section 4.2.5.6 at page 4-18. Proposed development projects in the Natomas Basin are discussed beginning on page 4-11 of the DEIR. In addition, the DEIR discusses the Master Plan for the Sacramento International Airport., beginning on page 4-9 of the DEIR. Thus, improved levees will not only benefit existing residents, they will permit additional planned development, and airport expansion.

Other Findings/Conclusions regarding Issuance of the Permit.

14. Based on the foregoing, and particularly on the evidence that the condition of the existing Natomas levees poses an unacceptable risk to life and property, the Board finds and concludes that the issuance of the Encroachment Permit No 18159-3 for the Sacramento

River East Levee Phase I Improvement Project, Reaches 1 Through 4B is in the public interest.

15. This resolution shall constitute the written decision of the Central Valley Flood Protection Board in the matter of Permit No. 18159-3.

Approval of Permit.

16. Based on the foregoing, the Central Valley Flood Protection Board hereby approves issuance of an Encroachment Permit in substantially the form provided as Attachment 1 of the Staff Report, and attached hereto as Exhibit A.

17. The Board directs the Executive Officer to take the necessary actions to prepare and execute the permit and related documents and to prepare and file a Notice of Determination under the California Environmental Quality Act for the Natomas Levee Improvement Program, Landside Improvements Project, Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4B.

DATED: March 21, 2008

THE CENTRAL VALLEY FLOOD PROTECTION BOARD OF THE STATE OF CALIFORNIA

_____
Benjamin F. Carter, President

_____
Maureen R. Doherty, Secretary

Reference 1

SAFCA Final Environmental Impact Report
Natomas Levee Improvement Program
Landside Improvement Projects
State Clearinghouse # 2007062016
November 2007

Reference 2

SAFCA Final EIR Exhibit B
Mitigation Monitoring and Reporting Program
Natomas Levee Improvement Program
Landside Improvements Project
November 2007

Reference 3

SAFCA Board Resolution 07-105
Natomas Levee Improvement Program
SAFCA Board Meeting Agenda Item 1
November 29, 2007